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ODONTOMES.

By J. W. Dunkerley, L.D.S.I.

Mr. President and Gentlemen,—I need hardly remind you of the almost romantic history of some of the great discoveries which have been made in reference to the nature and history of living things during the past century. The microscope, which was a drawing-room toy 100 years ago, has, in the hands of devoted and gifted students of nature, been the means of giving us knowledge, which, on the one hand, has saved thousands of suffering patients from terrible pain and death ; on the other, has laid the foundation of that new philosophy with which the name of Darwin will for ever be attached. When Ehrenburg, and later Dunjardin, described and figured the various forms of monads and bacteria, which the microscope revealed to them, no one could predict that fifty years later, these organisms would be recognized as the cause of that dangerous suppuration of wounds, which so often defeated the efforts of the surgeon, and made an operation in the hospital ward almost as dangerous to the patient as residence in a plague stricken city. Yet this is the result which the continual studies of the biologists have in due time brought to light. By the use of the microscope, the origin and development of the teeth have been revealed. As early as the seventeenth century, Anton Van Leeuwenhock, with the assistance of magnifying glasses, powerful, though of simple form, discovered and described the dental tubes. In inviting your attention to the microscopy of the dental tissues, I do not propose to offer any special discoveries of my own, but rather to describe in a plain and comprehensive manner, the peculiar character of the tissues which enter into the composition of Odontomes. In doing this, however, the greater part of what I shall exhibit will be that which I have seen myself. As most of you are aware, I exhibited some time since a number of instructive microscopical sections. Besides these, I have since specially prepared for this paper several more, and am now able to show you 25 plates, representing 33 pencil drawings for the hydro lantern ; 25 of which are original, being taken from my own specimens, while the remainder are copies from various other sources. Tomes and Salter will assist us to understand the different tissues which enter into the formation of an Odontome.

The subject of our paper this evening, is not a common one. The terminology of the word "Odontomes," is applied to those masses of dental tissues which result from morbid conditions of the formative pulp. They may consist in hypertrophies, local or general, or in various degenerations. But it is hardly possible to strictly define what is meant by an "Odontome" in the common use of the term. If we use the term as expressed by Salter, viz :—"Tumours of the hard tissues of the mouth," the name "Odontome" is a convenient and legitimate expression. Professor Broca in the year 1867, for the first time classified "Odontomes" according to the period at which they arise, dividing them into four groups.

1st. Those which arise before the development of the Membrana Eboris :—*Odontomes Embryoplastiques.*
2nd. Those which arise shortly before the formation of the cap of Dentine .—*Odontomes Odontoplastiques.*
3rd. Those which arise during the formation of the crown of the teeth :—*Odontomes Coronaries.*
4th. Those which arise during the formation of the fangs, after the completion of the crown :—*Odontomes Radicularies.*

Salter, however, considers this arrangement as both inaccurate and inconvenient, and this author's classification is more simple and easy to understand. He divides them into two groups.

1st. Congenital Odontomes, which he again divides into three classes. (*a*) Warty teeth. (*b*) Hernia of the fang, and (*c*) Enamel Nodules on fang.
2nd. Secondary or induced odontomes ; which is again subdivided into two classes. (*a*) Exostosis. (*b*) Dentine Excresence.

The first class mentioned by Broca, those which arise before the formation of Odontoblast cells, need not detain us, for at the period of their origin the dental germs contain no histological structure special to tooth germs.

Let me here call your attention to the fact that at a meeting of the Odontological Society, held in London, Mr. Eve, F.R.C.S., read a paper on "Some points in the pathology of cystic and encysted solid tumours of the jaws, with observations on the structure of the enamel organ." In his concluding remarks on Odontomata, he made the following statement. "It appeared to him that Broca's group was not really a homogeneous one, but included types of various pathological formations; the Odontomes Coronaries and Radicularies being simply forms of hypertrophy, whilst the Odontomes Embryoplastiques and Odontoplastiques must be regarded as true tumours." I am glad this statement has appeared, for it confirms my opinion about Salter's views.

I intend this evening to confine my remarks to one class of Odontomes, viz :—Odontoplastiques or warty teeth; for if I attempted to treat on all, it would detain us beyond the time at our disposal. In order to form a correct estimate of the origin of these pathological products, it is needful to keep in view the normal process of tooth formation.

According to Tomes, the development of the human teeth is as follows :—"About the end of the second month (in fœtal life) there appears a slight rounded depression, extending the whole length of the jaw, it and its elevated borders being formed by an increase in the thickness of the layer of epithelial cells; in a transverse section these cells show that they have made more progress downwards into the substance of the jaw, than upwards, so that a cul-de-sac of epithelium dips into the embryonic submucous tissue. From the bottom, or the side near the bottom of the depression, an inflection of epithelial cells takes its origin, which inclines inwards. This narrow inflection of epithelium, which in section closely resembles a tubular gland, constitutes the rudiment of the future enamel organ; it should however be noted, that at this time it is really a continuous sheet of epithelium, though dilatations do occur, but only at the several points, where teeth are subsequently to be found. Very soon the terminal enlargement, as it grows more deeply into the jaw, alters in form; its base becomes flattened, and the borders of the base grow down more rapidly than the centre, so that at its deepest portion it presents a concavity looking downwards; it might be compared to a bell, suspended from above, by the thin cord of epithelium which still connects it with the epithelium of the surface.

"It is at this time, that the cells occupying the centre become transformed into a stellate network in which large nuclei occupy the centre of ramified cells with processes which anastomose freely with those of neighbouring cells.

"These cells form the bulk of the enamel organ, and make progress from the centre outwards; but it stops short of reaching the layer of columnar cells, which form the surface of the enamel organ. Next to the dentine papilla is a narrow layer of unaltered cells which remain between the stellate cells and the columnar enamel cells constituting the "Stratum intermedium." So far the cells constituting the periphery of the enamel organ are alike. They are columnar, or prismatic, but from the time of the appearance of the dentine papilla those, which come into relation with it, become much more elongated and greatly enlarged, while those round the outer or convex surface of the enamel organ do not enlarge.

"The cells which lie like a cap over the dentine germ or 'papilla' as they elongate and their nuclei recede to their extremities, take on the character described as belonging to the 'enamel cells,' and is called internal epithelium of the enamel organ. The enamel organ thus consists of four distinct layers at this time. 1st, External epithelium; 2nd, Stellate tissue; 3rd, Stratum intermedium; 4th, Internal epithelium. Thus the enamel organ is entirely derived from the oral epithelium, with which, by means of its 'neck,' it long retains a connection, so that whatever products it may afterwards give rise to, must be regarded as epithelial structures.

"Corresponding to the ingrowth of the enamel cells, just at the time when the concavity is formed, appears the first trace of the dentine germ, which projects upwards into the base of the enamel germ, so that at a still later period the enamel invests the latter as a cap. When the dentinal papilla is growing into the future tooth, and is invested as by a cap by the enamel organ, a process grows up from the base of the dentinal papilla and invests the rudiment of the tooth. This upward growth separates the oral epithelium from the enamel organ, cutting as it were right through the neck of the latter. This is the dental sacculus, and furnishes the cementum and periosteum."

Having thus given an outline of the first formation of the teeth, the morphological changes which occur in their development would almost suggest to our minds the probable occurrence of the pathological change in the development of a pulp tooth into a warty mass. From some cause, yet unknown, there is a general enlargement of the dentine germ, which at this time is more or less covered by a layer of Odontoblasts, but dentine has not yet been formed. In consequence of this enlargement, the pulp becomes the seat of an irregular outgrowth. This mass may contain dentine from the calcification of the odontoblasts ; the enamel organ having followed, as it tends to do, the wanderings of the dentine germ, may be found in the dentine itself, or body of the tooth mass ; or the mass itself may be a confused heap of dental tissues, not bearing the most remote external resemblance to a tooth.

It may be well to bear in mind that the product of the calcification of a dentine pulp is by no means always true dentine. This I intend to demonstrate by placing two sections of tooth pulp under the microscope, one section from a healthy pulp, and the other from the pulp found in the odontome which is the special subject of this paper. Any calcification which may take place after the destruction of the odontoblasts will assume the form of secondary dentine, or of confused bone-like tissue, but no true dentine can be formed. You are already fully acquainted with the eruption of the teeth, and must have noticed the various forms of defective enamel, as fissures, pits, etc. These may be due to arrest of development, or may be the result of a rupture of the enamel organ. How this may be caused, it is not for me to determine in this paper, but it would make an interesting one.

The few cases of " warty teeth " that have been recorded, attest to the rarity of this malformation. To this both Tomes and Salter agree. It is not mentioned by Hunter, Fox, or Bell. Salter mentions two cases previous to his own in 1855, one by Oudet, and one by Wedl. The account of M. Oudet's case was published in Paris, in the year 1821, and that of Wedl in 1854. This author describes a specimen consisting of a molar tooth entirely transformed into a warty mass ; it was situated in the region of the right wisdom tooth, and was removed without much difficulty by the forceps. When extracted, the tumour exhibited an irregular cubic form, the surface was nodular and on the attached or basal aspect could be seen an excavated depression, surrounded by a projecting ridge, the circumference of which corresponded with the borders of the crown of the wisdom tooth ; two kinds of substance could be perceived on the surface: enamel and dentine. The examination of the section, which had been made perpendicular to the basal surface, showed that the bulk of this mass consisted of dentine, and the enamel was thickest at the circle around the base of the growth. The colour and disposition were those proper to enamel ; and only a small amount of true bone (Crusta Petrosa) could be found. Tomes mentions the same in his work on dental surgery. Also one which was mistaken for disease of the jaw (page 602). Dr. Forget records a similar case. The mass in this instance occupied the whole space between the first bicuspid and the ascending ramus of the jaw, and was by him regarded as the representative of the second and third molars of that side, the crown of one molar and the second premolar having been found held down beneath it. This mass was removed by a vertical saw-cut in front of the bicuspid, and a horizontal cut at the level of the inferior dental foramen. After removal, the jaw was found to be expanded over an uneven tuberculated oval mass of the size of an egg. Beneath it at one spot was found the crown of a molar tooth ; while between it and the bone was a thick and more or less fibrous membrane. On microscopic examination it was found to be mainly composed of dentine, the surface of which was in some places covered with enamel ; this latter dipping down into the crevices, at the bottom of which cementum was found.

In a case related by Mr. W. A. Harrison, before the Odontological Society, a mass occupying the whole space between the incisor and molar teeth came away spontaneously, leaving a groove large enough to receive the last joint of the thumb ; this speedily filled up by granulations.

At the monthly meeting of the Odontological Society, held in London, November the 7th, 1881, Mr. Charles Tomes showed a very large odontome which had been removed by Mr. Heath from the mouth of a young lady 18 years of age. It measured 1½ inches by 1¼ inches and weighed 315 grains. It consisted of a confused mass of dentine with slight traces of enamel ; no cementum was found, but some of the dentine was so coarse as scarcely to differ from cementum in appearance.

The first specimen of a warty tooth which I have had the pleasure of viewing, was given me by our worthy President (Mr. Smith) for microscopical examination. Hence this Paper.

The case occurred in his private practice, as follows. About 5 years since, a young lady aged 12 years, consulted him about the state of her teeth, and upon examination of the oral cavity, he found on the left side of the inferior maxilla a tumour of hard substance about the size of a large hazel nut, lying in the gum. The gum around it was swollen and inflamed ; the hard mass was loose, and occupied the space just behind the six year old molar, and it was removed without any difficulty by the forceps ; no hæmorrhage followed.

Since the extraction of the odontome, the thirteen year old molar has made its appearance, and the mouth now appears in the normal condition.

A very interesting query arises here ; viz., Does the tumour represent a supernumerary tooth malformed ? because the 2nd molar now in the mouth was produced about the usual time for its appearance. Whether this be so, time will show, for if in the course of 2 or 3 years, or more, the *Dens Sapientia* should make its appearance, it would undoubtedly prove it to be a supernumerary malformation, which would make the case all the more interesting, as I cannot find any record of such a fact.

You will remember that I exhibited this odontome at a previous meeting. It was then irregular in form, and of a brownish colour, convex on its upper surface, which was completely covered with enamel nodules of a pearly lustre. The sides were well covered, but the nodules were more minute, although closely packed together; the sides also were deeply indented. On the attached, or basal end, it was smooth and of a bony substance, and at one end there was a slight projection, with a large foramen.

I shall show you this odontome by the aid of the lantern in its true shape, previous to any portion being cut from it. The composition of the mass externally I found as follows : the brown layer surrounding the enamel nodules, was cementum deeply stained, but consisting of a very thin layer and containing little or no lacunæ. This layer covered the larger portion of the mass. The smooth part I found to be composed of dentine, and at the basal portion I found true cementum, which was thickest at the projection mentioned. When cut in very thick sections, it showed no trace of lacunæ, the same as the upper layer, but it was clearer in colour and quite transparent. Though in other sections, (prepared by first cutting thin portions by means of a saw, and then grinding and polishing the surfaces), the structure was one of pure cementum very rich in lacunæ, and make very beautiful objects. Upon further examination, I found that I was able to detach many of the enamel nodules without destroying the mass. They varied very much in shape, some representing miniature balls, pears, mushrooms, clubs, and potatoes, the natural size of some of them being only as large as the head of a pin. These nodules themselves were held together by a very thin layer of cementum, though it seemed in no way connected with them. I have mounted a very fine section of this layer, which I shall place under the microscope for your examination.

Some of the nodules I have ground down and mounted, and I may say that I had to be exceedingly careful in making and mounting these sections, for when being ground they were liable to crumble and thus destroy the sections; also in mounting them in Canada Balsam, I found that small portions would float away, and break into minute particles, as may be seen by the specimens mounted, showing their granular character. I found their composition to vary in different sections, although the structure of each externally was that of true enamel. Combined they represent enamel, dentine, globular dentine, interglobular spaces, vascular canals, vacuities and lacunæ.

To ascertain the real nature of the Odontome, I made a vertical section, with a strong but fine saw, and the structure was extremely friable, and the mass had to be held very carefully. When the section had been cut about half way through a very hard structure defied for a time any further progress, and so dense was this structure, that I broke several strong saws in the attempt to cut through; but finally succeeded, though in doing so, I broke one half of the mass into pieces. I now ground out the marks of the saw, and polished the surface. When examined by a hand lens, it showed that the enamel instead of covering the upper surface, dips down into the mass in every conceivable shape. Large cavities, which looked like canals and pits, could be seen here and there, giving it a cancellous appearance. Also a thick layer of enamel could be seen, almost in the centre only it was discoloured.

Having examined this part, I proceeded to make a thin section. Finding that the upper part could be very easily cut through, I determined to get through the base first, and by that means the difficulty was overcome. I now prepared the section for mounting; this gave a great deal of trouble, for being so flinty, it was liable to chip, or the cavity would fill with grit, and thus destroy the appearance; therefore, I could not make so thin as can be obtained in ordinary sections. But this was very fortunate, for although ground down it still preserved its true appearance. The little cavities now appeared under the microscope as large caverns and the whole section assume various shapes. The tissues also vary very much. In fact, the upper portion was a confused mass of enamel, dentine, and bone-like structure. Some parts of the enamel were stained a deep yellow, or brownish colour, in which no texture could be made out.

Some of the large cavities, which looked like canals in a state of involution, opened upon the surface, or these were simply vacules. In reality, these vacules exist in the centre of the enamel, which dips into the mass, and no doubt they are formed by the enamel dipping into the dentinal pulp, and then rolling upon itself again, and becoming united by calcification, enclosing some of the odontoblasts, or pulp, but not sufficient to fill the whole cavity. It is in this way, I think, that the enamel nodules are formed also, for the colour and disposition generally are those proper to enamel. The dentinal fibres I find to be irregular in distribution and size, and give off numerous branches; though the tubes nearly all originate around the cavities or vascular canals, and in some places they not unfrequently unite together into bundles, sometimes single, in other places into a great number, making the section look very black. Globular masses could be seen in abundance in these different systems with opaque interglobular spaces; lacunæ resembling those of true bone could also be made out, but I could not trace any crusta petrosa in the midst of the substance, though I firmly believe it does exist in the mass, for bone somewhat like cementum could be traced.

You will remember that in dividing the mass I had very great trouble in passing through the lower half of the body; this hard portion proves to be a very large quantity of enamel of a much harder nature than is found on normal teeth. The enamal prisms you will notice in the microsopical specimen are clearly displayed, and are those proper to enamel. Although the enamel in some parts looks of a yellowish colour, this colour really assists in making out its structure. Just underneath the enamel lies a large body of dentine in which two pulp cavities or canals pass through. In the upper or largest canal I found a very large portion of the remaining pulp, though very much shrivelled up. This pulp when prepared for mounting partook of the same nature as that of the odontome, having a fluty appearance, and with bone-like circular plates formed. Nerve and blood vessels can also be traced in the pulp.

The dentinal body in this portion is somewhat similar to true dentine, except at one part; where it is more compact, the tubuli radiating more or less around the canals. There is much globular dentine, which lies very thickly and close to the enamel with a very fine layer of interglobular spaces. These are not in reality empty spaces, for in the fresh condition they are filled with a soft substance resembling tooth cartilage, this dries up, and in microscopical sections cavities are formed which gives the appearance denominated interglobular spaces. In sections specially prepared by myself, I have filled these empty spaces and tubes by dipping the section in water, and placing the section at once in rather stiff Canada balsam; bubbles certainly appear, but by a little management they can be drawn out from under the cover glass. Professor Harting states that these globular forms are built up of concentric laminæ like an onion. These globules, when in contact, becoming agglomerated into a single laminated mass. So globular masses, sometimes appear like mulberries in form, but these soon lose their individuality and become smoothed down into a single mass. The occurrence of globular forms and interglobular spaces, is caused by an arrest of development. At the basal portion, the furthest away from the canals, it was bone-like in structure and very deeply laminated, and enamel and Haversian canals have a large share in making up this portion of the odontome.

How far these matters have interested you, I do not know, for at the best it is a very dry subject, but the work to me has been very interesting and instructive. I hope, however, that you will be pleased with the illustrations, which I will now throw upon the screen.

NOTES ON SOME CASES IN PRACTICE.*

By R. S. N. Faro, L.D.S., Eng.

In endeavouring to find a subject for my paper this evening, I have come to the conclusion that I might make it more interesting and I hope more instructive by selecting a few cases which have come under my own observation, and by noting their chief points, than by taking an abstract subject, and telling you a few facts or theories which in all probability you knew before.

Case I.—Miss A., a young lady of about 20 years of age, came to me three months ago to have a small crown cavity in the second left upper molar filled. The dentine of this tooth was endowed with so much sensibility, that merely wiping out the carious cavity with a little cotton wool in the tweezers occasioned pain. After two or three vain attempts to excavate the tooth, the patient refused to have anything more done unless I could first do something to deaden the pain occasioned by cutting the decay away. Carbolic acid, creosote, and oil of cloves did little or no good, and I resolved to try the effect of rapidly cooling the tooth by means of a spray of chloride of ethyl. This I did, after telling the patient that the spray would hurt a little at first, but would probably soon pass off. I was very gratified at the result, as I was able subsequently to thoroughly excavate without much difficulty. In this case I had the tooth surrounded with a serviette before applying the spray.

I had previously filled several teeth for this individual, who, though far from being what one would term a very good patient, was certainly not a particularly bad one.

Case II.—Mrs. B., consulted me with the view of having several of her teeth filled, and the stopping of the first two was accomplished without difficulty. When I proceeded to do the third and fourth, which happened to be the lower left second bicuspid and first molar, a very different condition of sensibility was manifested. These teeth possessed contiguous cavities on the gum margin, that is on the distal surface of the bicuspid and on the mesial surface of the molar. Both teeth seemed to be so extremely sensitive that anything approaching thorough excavation gave most excruciating pain. After having applied the rubber dam I proceeded to use the chloride of ethyl spray as in the former case, and with an equally satisfactory result. I have had the opportunity of seeing this patient several times since, and these two teeth have been, and I believe are, quite comfortable.

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* A Paper read before the Students' Society, National Dental Hospital, London.

So far as I have had the opportunity of judging, the chloride of ether spray appears to be a capital obtundent of sensitive dentine, and the initial shock is not greater than that occasioned by an application of chloroform or absolute alcohol. I may add that in all the teeth to which I have applied it, the cavity to be filled was a shallow one, and I should be somewhat afraid to use in any other cases, lest the shock occasioned to the pulp should be more than it could survive, at any rate in comfort.

Case III.—My next case is one not altogether new to some members of this Society, as at the February meeting this year, and again last May, I mentioned it among the casual communications. For the sake of those gentlemen present to-night, but who were absent at one or both of the meetings I have just referred to, I will briefly recapitulate the earlier history of the case, and I hope those who have heard it before will forgive my mentioning it again. At the February meeting I presented a model showing considerable swelling of the labial and palatine plates of the right upper jaw produced by suppuration in the antrum during a period of about three months, arising from an abscess in connection with the buccal roots of the first upper molar tooth on that side. On removing the tooth a small portion of the floor of the antrum came away attached to the anterior buccal root, and was followed by a considerable discharge of pus. Subsequently the antrum was periodically syringed with a dilute solution of permanganate of potash, the discharge ceased, and the swelling abated. At the May meeting, I presented a second model shewing the extent to which the antral mischief had subsided. At the beginning I had been careful to impress upon the patient the necessity of not allowing the opening to close up until the discharge from the antrum had ceased. This he had been so very careful to do that when I saw him again at the period of the second model he had a hole from his mouth into his antrum about the size of an ordinary penholder, which he was keeping open by means of a plug of cotton wool, which he found necessary to prevent the entrance of food during mastication. I then made a vulcanite cap to obviate the difficulty, this was worn for about 6 weeks. Last week, after an absence of six months, I again saw the boy, and I am happy to be able to show you a model of his mouth as it appears at the present time. The swelling on the lateral and palatine surfaces have disappeared and the large aperture leading into the antrum for which I made the vulcanite cap has gone. The gum has as far closed over as only to leave a V-shaped depression through the bottom of which I was able, on exerting a little pressure, to pass a probe into the antral cavity. It appears that the periosteum of the floor of the antrum in the vicinity of the aperture has become destroyed and consequently no new bone has been formed. This death of the periosteum has been evidently occasioned by its being bathed in pus for some time previous to the extraction of the first molar tooth. I had hoped that in so young a subject with plenty of cell activity there would have been sufficient vitality left in the periosteum to form new bone to replace the portion lost when the first molar was extracted. However, the gum has covered over the opening so well that the patient does not appear to be appreciably worse off for the loss of a portion of the floor of his antrum. In his work on Dental Surgery, Mr. Tomes in his chapter on Necrosis of the Jaws, mentions a case not unlike this one of mine. He had occasion to extract an upper canine and attached to the end of the root was found a fragment of necrosed bone forming part of the floor of the nose, into which air passed freely, and fluids poured through the nose when drinking. The aperture was covered with a process from the patient's artificial teeth, but although the hole had greatly contracted, after a period of some years it was still open and showed no disposition to close up.

Case IV.—In September 1889, Mr. C——, about 30 years of age, consulted me in reference to a long continued dull pain in the wisdom region of the lower jaw, on the right side. He had considerable difficulty in opening his mouth to any extent, and on examination, I detected the crown of the wisdom tooth just cutting through the gum. I advised him to wait for a time before having any thing done in the way of operative treatment to see if the pain went away as the tooth erupted. In the following November, he returned, saying the discomfort still continued, and I found that although the tooth had risen somewhat since September, it was prevented from doing so any more by the crown of the corresponding upper wisdom tooth. This tooth, which had been fully errupted some years, and was slightly carious, was removed on the advice of Mr. George Pedley, and this was followed by complete relief. Just after Easter, 1890, about five months since the extraction of the upper wisdom tooth, the patient again returned complaining of the old trouble which had just recurred. The lower wisdom tooth seemed to be in pretty much the same position as when I saw it in the preceding November, and after some deliberation, we decided it was impossible to extract it, and accordingly removed the next tooth, the 2nd molar, which was free from caries, but considerably exostosed. About two months afterwards, I again saw the patient, who reported that since his last visit he had experienced no further pain, but that lately his face on that side had been swollen, and that he had a slight discharge into his mouth about which he had consulted his family doctor. On examination I found the external plate of the right side of the lower jaw considerably enlarged from the region of the 2nd bicuspid to that of the wisdom tooth which was now thoroughly erupted and apparently healthy. I may add he had lost his first lower molar some time previous to my first seeing him.

On the gum opposite to the root of the 2nd bicuspid, was a large papilla with a fistulous opening into which I introduced a probe, to a distance somewhat over an inch, in a direction backwards and downwards. I was unable to detect any dead bone, but thought, possibly, there might be some, an opinion shared with his medical man, and, as I heard subsequently, by one of the Surgeons to the Middlesex Hospital, whom he afterwards consulted. After this I lost sight of the case until last week, when the patient again returned, saying the discharge had been slight, but constant during the past seventeen months since I had last seen him, and the swelling continued about the same size. During this interval, however, the wisdom tooth had died without pain and there now was a deep crown cavity communicating with the pulp chamber. The patient also informed me, that sometimes, on pushing his tongue into the carious cavity, he could cause a small quantity of pus to escape through the fistulous opening opposite the 2nd bicuspid. I accordingly advised the extraction of the wisdom tooth, and last Friday under the influence of nitrous-oxide gas performed the operation. Decay had penetrated so deeply into the tooth substance, that the crown was completely broken up while trying to extract the tooth with forceps, but I subsequently succeeded in doing so with a curved elevator.

On examining the tooth I found the condition of the posterior root to be fairly normal, but almost the whole of the anterior appeared to have been absorbed away, and the little that remained to be of a very black colour. I will now pass round this tooth and the second molar which was extracted previously.

The condition of the wisdom tooth appears to me to be one of considerable interest. In the first place it appears probable that the pus in the jaw, which escaped through the fistulous opening opposite the bicuspid, was caused by the long inflammatory process going on at the time the wisdom tooth was endeavouring to erupt, and the presence of pus around the anterior root would account for its death and necrosed appearance. But when and how was the absorption of the root brought about? I think that during the period of long continued irritation preceding the eruption of the tooth, and prior to the occurrence of suppuration, the absorptive action must have taken place. As far as I have been able to ascertain the action of the osteoclasts, which are instrumental in producing absorption is always stopped as soon as necrosis supervenes. This we see constantly in the teeth of the first dentition. The only other solution to the question is to attribute the loss of the root to the solvent action of the pus in which it was bathed for at least seventeen months. Ordinary or healthy pus is an alkaline fluid, and so incapable of dissolving dead bone tissue, but Mr. Pepper mentions that pus from chronic abscesses may contain traces of stearic acid, and no doubt if this constituent were in sufficient quantity it would be able to produce disintegration of lime salts. I still have the patient under observation and hope to be able at a future meeting to report on the ultimate development of the case.

In conclusion, I must thank you, gentlemen, for having listened so patiently to these remarks, and I trust a good discussion will follow.

British Journal of Dental Science.

LONDON, JANUARY 1st, 1892.

A SUMMARY.

Another year ! Scarcely possible as it may seem, the year 1891 has fled away, and we find ourselves again at the beginning of a new one, of 1892. We cannot find anything in the past year to look back upon and say, "this will make the year memorable in the annals of dentistry." It has been one of the great majority of years, of continuous work, and steady movement forwards but essentially a year of little things Many ideas have been mooted, many suggestions put forth, a few ideals carried into realization, and this is its history. One is surprised, however, looking back through records of work done in different lands to find how extensive is this work, made up, doubtless, of little things, but then the grandest work of creation is made up of its atoms. So it is that in glancing backwards, and how useful it is to look back, we find little that is in itself worthy of special comment. In the personnel we find a steady decrease in the number of unqualified practitioners and an increase in the number of those who have had the advantage of a college training. Gradually, it is to be noted, that these latter, who may be said to form the better class of practitioners, are seen to be settling in different parts of the country, a process of decentralization which, though it can hardly be to the advantage of the town practitioner, is undoubtedly of the greatest possible convenience and service to the community at large. At the schools there is a steady increase in the number of students; an increase, perhaps, not in excess of the needs of the public, but which, it may be hoped, will not become so great as to lead to that injurious competition which is working such ill in the Medical Profession. The results of examinations have called attention to the very inefficient instruction which some practitioners give their pupils, a neglect of duty, which, if not rectified voluntarily, will probably lead to some more drastic corrective. The inequality in the time required of one who can, by reason of convenient residence, attend, in some sort of a fashion, the hospital and in the workroom concurrently, and one who cannot do so, again requires attention; whilst the fact, that candidates who have failed at one examination are yet able to pass another with comparative ease, is suggestive of the need of inspectors for these examinations. The different schools show growth in their teaching accommodation, some have obtained this by increase in size of buildings, others by opening during the afternoon as well as the morning, an increase in the staff having been made to render this possible. The scheme by which artificial dentures are supplied to the needy poor at the Dental Hospitals may still be said to be on its trial, some changes in the personnel of the staff, would seem to suggest that there is not perfect unanimity on the question. Defects will no doubt be discovered and rectified.

Among operative procedures the implantation of artificial teeth by Dr. Znamensky of Moscow, excited a good deal of attention, but can hardly be said to be at present beyond the experimental stage.

Much useful work has been carried on by Dr. Miller of Berlin in regard to the relative efficacy of antiseptics, and on other matters. It is much to be hoped that his resignation of the post in the University of Berlin, and his appointment to the Professorship of Histology in the University of Pennsylvania will tend rather to quicken than decrease his interest in dental matters. An interesting paper, giving the result of some investigations by Mr. Howard Mummery, was read before the Royal Society, these results, if accepted and verified, would place dentine in the class of connective tissues its formation being similar to that of bone, a secretive process rather than one of conversion. Amongst the various books that we have received, Farrer's "Treatise on the Irregularities of the Teeth," and new editions of Harris' "Dictionary of Dentistry" and of Fletcher's "Metallurgy" call for special comment.

The scheme for obtaining a direct representative on the Medical Council remains in *statu quo*, the promotors of the idea no doubt showed a wise discretion in not pressing it at the recent election. Meanwhile we may note that at the close of the year the Medical Council have taken under consideration the question of "Covering." This, in its objectionable sense, is held not so much to mean employment of nonqualified assistants at home, as their being left in charge of branch practices.

A far more moderate, and, as we think, therefore a more, wholesome tendency, has been noticeable in those who are in the habit of riding their hobbies to death.

It is with sorrow that we remember that whilst we have been working, others have been dying. Death has been busy in our midst, and of those who have gone from among us, none will, perhaps, be more generally missed than Atkinson, Cartwright, and J. W. White. Of the record of 1891 it may be said :—though it could have been better, it might have been a great deal worse.

A REGISTER of operations done has often more uses than one. In the case of the bomb outrage in Mr. Russell Sage's office, such a register has served an altogether unexpected turn. It will be remembered that the perpetrator of the outrage was killed during the explosion which followed, and owing to the mutilation of the body its identification was difficult. The head has, however, been recognised as that of a broker, Norcross, and not the least link in the chain of evidence was the fact that the fillings in the teeth corresponded with those entered in the dentists' Register as having been filled by him for Norcross.

A case of the early appearance of the temporary teeth is put upon record by Dr. Hugh Jones, of Dolgelly, North Wales. He says:—"On November 26th, 1891, at the Union Workhouse in this town, a young woman was delivered of a healthy, well developed male child. On examining the child's mouth, I found that one of the central incisor teeth of the lower jaw had already made its appearance through the gum; and on examining the child again on December 10th, I found that the other central incisor of the same jaw had come completely through. As far as my knowledge goes this is an unusual occurrence, and I therefore thought it was worth recording."

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The installation of the electric light at the Dental Hospital in Leicester Square, is now nearly complete. It may be remembered that this was undertaken in consequence of a donation of £100 for the special purpose, unfortunately, it is said, that the cost will considerably exceed that amount. The immense convenience it is to the students has been abundantly proved.

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A Contemporary puts the election of one of the most distinguished of the members of our profession to the membership of a foreign Society, under the heading Microscopical Gossip; surely this is rather hard on our distinguished confrère.

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The interesting lecture which Mr. Jonathan Hutchinson delivered at Liverpool, on "The Surgery of the Tongue," contains two statements which are worthy of note. Firstly, that cancer of the tongue has, comparatively speaking, but little tendency to return in the stump after excision of the organ. And secondly, that it has a very great tendency to return in the lymphatic glands even though the tongue be removed directly the ulcer assumes a suspicious appearance.

The practical importance of this latter fact is great. It urges the early detection and treatment of the disease, and the removal of all enlarged glands. These glands may be situated in one of three situations, in the floor of the mouth, just in front of the sterno-mastoid muscle or just behind it. In the last case Mr. Hutchinson does not advise attempt at removal. In it is interesting to note that enlargement occurs in only one of these situations. Seeing the infrequency of recurrence in the stump, though he operates wide of the disease, he advocates partial excision as against total extirpation of the organ. He usually uses the wire ecraseur, which he allows to cut its way slowly, generally taking half an hour. He believes that through adopting this almost bloodless method his successes have been due, for neither is his patient, already worn by disease, further weakened by the loss of blood, nor does this trickle down the trachea during the operation, so avoiding the occurrence of pneumonia. We are sorry to say that the only patient Mr. Hutchinson has lost, as far as his memory serves, after excision of the tongue was a dentist, an American, in reduced circumstances, on whom he operated in the London Hospital. Erysipelas complicated the case. If we may learn a lesson from the lecture it is this:—Be on the look out for ulcers, and treat them early.

The British Medical Association are about to undertake an inquiry into the "Clinical evidence concerning the action of anæsthetics." The following general committee has been elected:—Mr. Jonathan Hutchinson, F R.S., President; Messrs. Annandale, Joseph Bell, George Buchanan, H. T. Butlin, Drs. Dudley Buxton, Hector Cameron, Messrs. Chiene, Croft, Croly (President of the Royal College of Surgeons of Ireland), Duncan, Durham, Eastes, Dr. Hewitt, Sir Joseph Lister, Bart F.R.S.; Dr. Macewen, Sir George Macleod, Dr. Rawdon Macnamara, W. V. Snow, Mr. Pridgin Teale, and Dr. Christopher Childs, Honorary Secretary, several of these forming a smaller executive committee. It is hoped to obtain a large amount of assistance from practitioners in different parts of the country, and a record book, containing full instructions, will be sent, on application to the Honorary Secretary, 2, Royal Terrace, Weymouth. The investigation is to commence on January 1st.

THE election of the direct representatives to the Medical Council, has resulted in the return of all the old members. Dr. Bruce was returned for Scotland unopposed. Dr. Kidd, Ireland, scored 872 votes against his opponents, 516, and in England, where the chief interest of the contest lay, Dr. Glover, Mr. Wheelhous eand Sir Walter Foster were, however, again returned by substantial majorities. Only sixty per cent. of the voting papers were returned.

Dr. McLane Hamilton, of New York, has met with an interesting family of bleeders. Five out of a Jewish family, of six, showed this tendency which (following the rule that though hæmophilia occurs in the males, it is inherited through the mother), they inherited from their mother. The bleeding first proved troublesome when circumcision was being performed.

THE following gentlemen having passed the necessary examinations, were admitted Licentiates in Dental Surgery, at the Royal College of Surgeons, England, at the Council Meeting held December 13th last.

F. A. Armitage, E. Balding, C. E. Bromley, G. Dalton, N. M. Davis, E. L. Eskell, W. Fisher, E. Gardner, R. N. Gracen, E. B. Jones, J. Kekwick, F. T. Ladmore, P. T. Leigh, E. A. Mansell, A. Prager, P. B. Reading, J. Royston, W. B. Samson, T. E. Sherratt, A. P. Spurr, J. C. Stokoe, F. W. Ta' Bois, H. W. Taylor, R. E. Waller, and C. H. Watson.

Thirty-nine candidates presented themselves for the Dental Examination, 25 of whom passed and 14 were referred back to their professional studies for six months.

CREMATION IN VENICE.—Cremation is now extending largely almost in every country, the latest edition to crematorium is at Santo Michele, Venice, Italy.

THE CHAIR OF HISTOLOGY IN PENSYLVANIA UNIVERSITY.—We are informed that the chair of histology vacant in the University of Pennsylvania U.S.A. has been offered and accepted by Dr. Miller, well known in the dental world as for many years professor of dentistry in the Berlin University.

THE RESPECTIVE MERITS OF CHLOROFORM AND ETHER AS ANÆSTHETICS.—The majority of the members of the Liverpool Medical Institute in discussing the relative merits of chloroform and ether as anæsthetics at their recent meeting, came to the following conclusions :—That the mortality from chloroform as compared with ether, from computed statistics, recording greater mortality from chloroform, are valueless ; as chloroform was constantly given in minor operations by private practitioners, and such administrations never appeared in the statistics unless they were fatal, so that these cannot be correct, and that a certain proportion of deaths was due to some idiosyncracy of the patient's. If chloroform were given carelessly, and in very concentrated doses, it would kill more than ether, but ether if inhaled, on account of its rapid evaporation at a low temperature, so reduces the patients, temperature that even if given by skilful and experienced hands, sometimes induces fatal pneumonia or bronchitis, according to the circumstances of each individual case. The preference should be determined by the nature of the operation, but for minor operations ether should be used. The stomach and bowels should always be relieved before administering chloroform, and the administrator should always watch the patient's pulse, respiration and countenance, and not intrust this important matter to any one else. Lastly, they considered that methylated chloroform and pure chloroform are identical in their composition, and no difference has beendetected in their physiological effects.

Selection.

THE CROONIAN LECTURES.

On the Progress of Discovery Relating to the Origin and Nature of Infectious Diseases.
Delivered at the Royal College of Physicians, London.

By J. Burdon-Sanderson, M.D., Ed., F.R.S., &c.,
Professor of Physiology in the University of Oxford.

THE ETIOLOGY OF INFLAMMATION.

In the discussion of the etiology of inflammation in the last lecture, I understood the word "inflammation" to be the name for the changes which occur in a living tissue in consequence of an injury. These changes collectively may be correctly called "inflammatory reaction." They consist in the Hunterian "determination of blood," and the consequences which for the last quarter of a century we have associated with active congestion—namely, exudation of liquor sanguinis and emigration of colourless corpuscles. With reference to the whole process I wish it to be understood that I adhere in every particular to the view of it given in my lectures of 1882, and, in particular, that the word "inflammation" is still to be understood as meaning a process characterised by the formation of pus, and having its seat in the capillaries.

As regards the cause of inflammation, the general result of the study we made of the subject a week ago was that, in all those instances in which suppuration occurs, if one may so express oneself, under ordinary conditions, the efficient cause of the morbid process is always a morbific microphyte, it being understood that there are several species of micrephytes which can more or less replace each other as pus-producing agents. We took the yellow cluster-coccus as the most characteristic representative of the class, and one of the most active. Up to the time which immediately preceded the discovery of these microphytes the principle was accepted in pathology that an inflammation might be produced either by a mechanical, by a chemical, or by a thermal injury—i.e., that it might result from violence, from the action of an irritant, or from exposure to heat or cold. But long before then experiments such as those of Professor Kocher of Berne (referred to in my last lecture), in which he found it possible to subject the most vulnerable tissues, such as the marrow of bone, to mechanical injuries of the most violent kind, provided only that microphytes were excluded, as well as the experience which was year by year accumulating in the practice of aseptic surgery, had made it clear that, at all events, mechanical injuries were incapable of giving rise to suppuration of themselves. But the question whether the proximate cause of an inflammation may be purely chemical was, up to a very recent period, undetermined. The previously accepted belief, according to which suppuration could be produced by any chemical irritant of sufficient intensity, was discredited by the insufficiency of the evidence afforded, that in all the instances investigated microphytes were rigidly excluded, and it was not yet proved that when the strictest precautions were enforced which bacteriology can suggest, certain chemical agents are still capable of producing suppuration. Consequently the dictum commonly attributed to Weigert, "no suppuration without bacteria," became generally accepted. My aim must be just now to restore the old doctrine in so far as to show that, leaving out of consideration those wholly exceptional instances in which inflammation is produced by exposure to heat and cold (and which have not yet been investigated in their relation to microphytic influence), the proximate cause of inflammation is always chemical. To justify this proposition I must show, first, that inflammation—that is, suppuration—can be produced by chemical agents in the absence of microphytes; and secondly, that when it is produced by microphytes the action is chemical.

For the establishment of the second point I shall have to refer to a series of observations extending over about eight years, made by a number of highly competent bacteriologists. The methods of experiment by which the proof has been finally attained are various, but of them all the essential feature is to introduce sterilized irritant liquids either subcutaneously or into serous cavities, using precautions to preclude the entrance with them of microphytes. The earliest of these experiments were made in 1881, but it was not until after that time that the perfect means of sterilization and the improved technique of infection experiments which Dr. Koch had created had come into general use. One of the first of the more exact investigations of the subject which this technical advance rendered possible was that of Dr. Councilman,* at the suggestion, I believe, of the late Professor Cohnheim. It consists, first, in charging capillary tubes with the liquid to be experimented on, closing the ends hermetically, and then after sterilising the tube and its contents, introducing it under the skin and closing the wound antiseptically. After it has remained for several days it is broken between the fingers so as to discharge its contents subcutaneously. The method is not open to any objection as regards risk of contamination, provided that it is properly carried out. It may, however, be alleged that, inasmuch as even a glass tube becomes encapsulated—that is, becomes surrounded by cicatrical tissue which is known to be relatively liable to inflammation—the experiment does not afford a true criterion of the susceptibility of perfectly normal tissue to the chemical agent which it is desired to test.

This consideration led Dr. Scheuerlen,† who worked at the subject later, to improve on the Cohnheim method by substituting fusiform for cylindrical tubes, and to introduce the tube under the skin, say over the sacrum, to shove it up to the neck, and let it rest; then, having ascertained that it produces no disturbance, move it to a new position, and at once break both points. By this method the contained liquid very slowly finds it way into the subcutaneous tissue. Similar tubes may be used for introducing liquids into the peritoneum, in which case it is desirable to attach them to the wound by a long, sterilized silk thread. In all cases the skin must be washed with alcohol and disinfected with 1 per cent. corrosive, and then covered with a layer of collodion. The chemical substances experimented on, either by this or by other methods, have been extremely various. I can refer only to the most important such as, among organic substances, mercury, nitrate of silver, and ammonia : among organic, turpentine and croton. Mercury produces suppuration in the dog, not in the rabbit. In the former, if it is injected hypodermically, each drop becomes the centre of a minute abscess. Silver nitrate in 5 per cent.solution produces suppuration in the dog with great certainty, but not in rodents. Ammonia fails to produce pus in any animal. It is either absorbed or kills the tissue with which it comes into relation. Of organic substances, the body which has been most experimented on is turpentine. In the carnivora, indeed, it produces abscess with great certainty. The organic action of croton is similar, but inferior. In all these experiments it must be understood not only that the materials used are sterilized, and that they are introduced with the most rigid antiseptic precautions, but that the pus obtained or produced is tested by cultivation, and that dry cover-glass preparations are subjected to microscopical scrutiny. In every instance, provided that the experiment has been properly performed, the inflammatory exudation liquid is sterile.* The conclusion to be derived from these facts scarcely needs stating. It is not true, as we once inclined to think possible, that suppuration can only be brought about with the concurrence of microphytes. On the other hand, the experiments show that the readiness with which pus is formed depends on conditions which belong to the animal rather than to the noxa. In the dog a sterile abscess can be produced with ease with such different agents as mercury and turpentine, but it is much more difficult to obtain this result in a rodent.

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* Councilman: Zur Aetiologie der Eiterung. (Virchow's Archiv, vol. xcii.)

† Scheuerlen: Weitere Untersuchungen ueber die Enstehung der Eiterung. (Langenbeck's Archiv, vol. xxxvi.)

The other point I have undertaken to prove is equally important. It is not only true that inflammation can be produced without the co-operation of microphytes, but that, when these organisms are directly concerned in its production, their mode of action and its proximate cause are still chemical. We have already seen that the two effects which the cluster-coccus exercises on its surroundings are, first, destruction of the vitality of the elements which come immediately within its influence, and secondly, the evoking of exudation and emigration of leucocytes from the capillary of bloodvessels in the neighbourhood—effects which can only be explained on the supposition that these microphytes, so long as they continue to vegetate and multiply, give off products which are sufficiently diffusible to impregnate the tissue, but not sufficiently so to be easily absorbed. The experimental proof that this is so lies in the observation that not only in the case of staphylococcus, but in that of many other micrococci, the symptoms which result from the presence of the microphytes themselves in the living organism can also be produced by the soluble chemical products of their vegetation. So long ago as 1878 M. Pasteur* showed that cultures of the "microbe générateur du pus" which had been sterilised were as capable of producing abscess as living cultures, and that the resulting pus was sterile: but it was not until a few years ago (1887) that Grawitz† made similar experiments with pure cultures of pyogenic microphytes, particularly with the ordinary staphylococcus. Since then various other experimenters have investigated the subject in relation to this and other pus-producing microphytes, with the general result that in carnivora sterile abscesses can be produced with the same certainty by the injection or introduction of devitalised cultures of staphylococcus as by turpentine or mercury. In rabbits, when a Cohnheim's tube, charged with such sterilised cultivation, is used, the same phenomenon presents itself as if the tube contained croton—leucocytes creep in at the end.

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* J. Steinhaus: Die Aetiologie der Acuten Eiterung, pp. 152-170. Leipzig, 1889.

PART II. "*Chimiotaxis*" *of Leucocytes.*—It is thus apparent that local inflammatory reaction is always dependent on the chemical action of the noxa. Now, in this reaction, there is one factor more prominent than any other—that is, the colourless corpuscle or leucocyte. When you introduce a capillary tube containing a bubble of mercury underneath the skin of a rabbit and break the ends, almost the only sign of reaction is that leucocytes creep in at the ends as if to explore or find out what is in the tube. The behaviour of leucocytes in this and other similar cases has for the last twenty-five years attracted the attention of pathologists, and has repeatedly suggested the idea that the movements of these "wandering cells" are guided by something like *discrimination*. Of late the theory that leucocytes are endowed with special powers for the protection of the organism against the invasion of contageous microphytes, and that they first swallow and then digest them, has been so energetically advanced by its author, and supported by arguments and seeming proofs of so convincing a character, that it has exercised a very marked influence. This theory well deserves our attention, both for this reason and in consideration of its scientific importance. But before we enter on the examination of the experiments on which it is founded, I am desirous to draw your attention to another aspect in which the part which leucocytes play in the process of inflammation and their function as phagocytes may be considered. It was several years ago observed by the distinguished plant physiologist, Professor Pfeffer, with reference to a variety of motile unicellular structures, that the power which they enjoy of locomotion in water, and particularly their power of apparently guiding their own movements, may be accounted for on the principle that in executing them they are allured towards any substance in the media in which they live, provided that it is not too remote ; and that the attracting object contains some soluble constituent which is, so to speak, *agreeable* to the attracted organism with which its immediate neighbourhood is impregnated. To this attraction, which seems to imply the existence in the simplest organisms of a rudimentary sense of taste, Pfeffer has given the name "chimiotaxis," denoting thereby that, however incomprehensible the movement may be, there is yet a definite relation between it and the chemical substance by which it is enticed—or, putting it otherwise, between the *vital movement* and the *chemical action* which determines it.

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* L. Pasteur: De l'Extension de la Théorie à l'Etiologie de quelques Maladies Communes. (Bulletine de l'Acad, de Med., Nov. 4th, 1890, p. 435.

† Grawitz u. de Bary: Ueber die Ursachen der Subcutanean Entzundung u. Eiterung. (Virch. Arch., vol. cviii., p. 67.)

Now, as regards leucocytes, we have long—I might even say all along—recognised that although their power of amœboid movement may explain their power of incorporating objects with which they come into contact, and may even help us to understand their ability to squeeze themselves through very narrow openings in the walls of the blood-vessels, it did not serve to account for their tendency to emigrate. In describing the phenomenon for the first time in 1870, I admitted myself wholly unable to state why "in an inflamed part leucocytes should separate from the blood and tend towards the internal surface of the veins and capillaries." Metchnikoff, writing in 1883, makes this a reason for regarding Cohnheim's doctrine of inflammation as unsatisfactory. A few years ago it was suggested by Dr. Leber that the migration of leucocytes might be regarded in the same light as the migration of anthero-zoids and zoospores had been regarded by Pfeffer—*i.e.*, that the escapes of the colourless corpuscles might be due to the existence in the tissues of chemical substances attractive to them. The suggestion has since led to a number of experimental investigations, of which those of Buchner in Germany and of Massart and Bordet in Belgium are perhaps the most important. The method employed is similar to that which I have just described in its application to the determination of the phlogogenic properties of various chemical substance. In its simplest form it consists in charging a capillary tube with the liquid of which the "chimiotactic" properly is to be tested, closing one end and then introducing it into the lymphatic cavity of a frog, the result being that if the material is chimiotactic leucocytes swarm round the open end of the tube and crowd into the liquid it contains. It might, however, be objected that these phenomena are merely the indications of a process of inflammation, consequent on the presence of a foreign body in the lymph sac. It is, however, easy to give such a form to the experiment as to exclude this interpretation. The plan which I have myself adopted is to seal two capillaries together and to charge the one with the liquid to be tested—as, e.g., with sterilized culture of *staphylococcus*,—the other with an indifferent fluid, such as the fresh bite of the frog. The contrast between the one and the other affords the required evidence that in "going for" bacterial product they are actuated by their own free choice. But in admitting this we must guard against the supposition that in the exercise of this choice the leucocytes are actuated by a "protective" motive, for Buchner has conclusively shown that although the constituents of certain microphytes are specially attractive to them, they are scarcely less partial to products of similar nature derived from the tissues of the higher plants. The facts of chimiotaxis may serve to explain, however, the leucocytes, like vultures, gather together "wheresoever the carcase is," but they do not afford any support to the theory of Metchnikoff that they are actuated by an almost conscious discrimination of what is advantageous to the *organism as a whole* from what is detrimental. In the examination of that theory, which I propose to begin to-day, we shall see that while we are now able to understand better than was before possible that, as Sir John Simon taught thirty years ago, there is an antagonism between inflammation and contagion, between leucocytes and viruses of all kinds, there is no reason for attributing this to the maintainance of a mysterious relation between the leucocyte and the organism with which it is no longer in structural continuity.

Metchnikoff's theory was first developed in 1884. It was founded on a theoretical conception derived from the science of morphology—viz., that the familiar process by which a leucocyte takes into its own body any small solid particle which happens to be suspended in the liquid medium in which it lives, is an attribute which it derives by inheritance from the remote progenitors of the animal of whose body it forms a part*—*i.e.*, eventually from amœba, and less remotely from cœlenterates, the mesodermal cells of which enjoy this faculty of incorporation in a high degree. That in these animals intracellular incorporation performs an important part in digestion and in the absorption of effete structures there is no reason to doubt, nor is there any doubt that not only leucocytes, but other fixed cells of mesodermal origin, exist in the bodies of vertebrates, and are capable of incorporating. The fact has been familiar to every student of medicine for twenty years, and known to physiologists much longer; but it remained for a morphologist to point out to us that we saw, but perceived not, that the intracellular incorporation is in reality a "protective mechanism," and that the cells which exercise this function are endowed with the power of distinguishing between what is advantageous and what is pernicious, but of appreciating all the fine distinctions of ills to which flesh is heir. All such cells Metchnikoff calls phagocytes, and speaks of them as of two kinds, microphages and macrophages, words which it is to be hoped will not find their way into the English dictionary. Under the former term he includes what, for the last twenty years we have commonly called leucocytes. Under the second a variety of histological elements, most of them old friends, among which are included the connective tissue corpuscles, the large pulp cells of the spleen, and the large cells with vesicular nuclei which, in the mammalian liver, surround the capillaries—all of these have single nuclei,—and finally the so-called epithelioid and giant cells of tubercle. The introduction into Metchnikoff's theory of elements of such different kinds is a complication. As, however, the colourless corpuscles of the blood take chief part in the process of inflammation, it is to them that the prophylaxis of the body against the invasion of microphytes is chiefly assigned.

It cannot, I think, be doubted that one reason why this theory has attracted so much attention is that its author, himself a morphologist, has clothed it in the language of a science which is now in vogue. When the human or animal body is invaded by a morbific microphyte, he imagines a "struggle for existence" to occur between phagocyte and microbe. In this struggle it adapts itself to its *environment.* According to Metchnikoff, this adaptation is not only acquired by those leucocytes which have actually taken part in the fray, but is handed down to their posterity, and so their supposed protective function is explained. The diagram serves to illustrate the way in which, in a well-known crustacean, the corpuscles of the circulating fluid crowd round and seize upon the spores of a parasitic plant which in this animal is the cause of an infective disease. The transparency of the tissues renders it possible to watch the process by which the leucocytes exercise their protective function. The paper from which this drawing is taken was published in 1884, and the observations contained in it were the starting-point of Metchnikoff's pathological studies. One of the earliest subjects of observation was erysipelas, a disease well adapted to his purpose as one of which the microphyte origin had been very definitely ascertained. But before I give an account of these researches I must remind you of one or two preliminary facts relating to the pathological anatomy of erysipelas. Twenty years ago we knew from the researches of Volkmann and Steudener that in skin which is being invaded by the spreading inflammation the change consists in intense vascular injection of the superficial layer of the corium and corpuscular infiltration of the cellular tissue, following the course of the blood-vessels and interfascicular spaces; and that the raised border which one feels with the finger in passing over the line of extension from the healthy to the inflamed area was due to exudation of liquid containing leucocytes, which in process of time were disintegrated and absorbed; but it was evident that "changes must take place of the skin antecedent to the corpuscular infiltration,"* and that if such changes existed "they would be found, not in the inflamed skin, but in the skin about to be inflamed—not in the swollen line of extension but beyond it." Guided by this consideration, Lukomsky, a young pathologist who worked under Professor von Recklinghausen, was able to show by such methods as we then had at our disposal that the first stage in the erysipelatous process is not either exudation or emigration, but the choking of the lymphatic channels of the corium with micrococci. As to the nature of these micrococci, all that we then knew was that they were in chaplets, not in clusters. I had the opportunity of observing this in several cases at St. Thomas's Hospital, and particularly in one in which it was perfectly easy to obtain exudation liquid containing chains by tapping with a perforated needle the very edge of the spreading redness. Here, then, was a case eminently suited for illustrating the antagonism between leucocytes and microphytes. What are the details of the contest? Koch and Fehleisen both were able to show that in a spreading erysipelas cocci are to be found only at or rather beyond the visible edge of extension, where the skin is apparently as yet unchanged; and that at the swollen edge, where the vessels of the papillary layer begin to be injected, and leucocytes abound in the lymphatic spaces, the cocci are less abundant, and those that there are can no longer be stained. That they disappear, and that their disappearance is coincidence with the appearance on the scene of innumerable emigrants, is not disputed; but how this happen is open to question. Let us hear what Metchnikoff says. What he observed was—first,* that wherever the process goes on normally many leucocytes are charged with streptococcus, although there were also many free from them; but that in parts which were "going wrong" incorporation was almost absent, and that the reason why the struggle for existence between leucocyte and microphyte terminated in favour of the latter was, to put it plainly, that there was not enough inflammation. Throughout, according to this view, the want of reaction is the sign, if not the source, of danger. The unfavourable condition in a wound which makes it likely to be the starting-point of an erysipelatous inflammation is that it is not suppurating freely, and the unfavourable condition in an erysipelas already begun is that there is not enough corpuscular infiltration. We have, therefore, here unquestionable antagonism between inflammatory reaction—that is, abundant exudation and emigration—and the manifestation of infective virulence, nor can it be questioned that the facts afford evidence of the beneficial influence of intra-cellular incorporation, in so far as they show that in general, the issue is most favourable when the process is most active, and that we have in them a fresh proof of the power which the living body possesses of defending itself against the invasion of disease-producing microphytes. What they do not show is that this function is dependent on incorporation by leucocytes. All disease-producing microphytes die, some rapidly, others more gradually, when they are surrounded by living tissues of man or the higher animals. *All are sentenced to death. The question is, Is death always preceded by imprisonment?* This is a question which cannot be determined by merely watching processes from outside. It can only be determined by experimental methods, in the application of which no one has shown more resource and ingenuity than Metchnikoff himself. Let me now shortly describe to you some of the proof on which he chiefly relies.

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* Metchnikoff· Untersuchungen ueber die intercellulare Verdanung bei wirbellosen Thieren. (Art. aus dem Zool. Institut zu Wien. vol. v., p. 141.

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* Metchnikoff: Ueber eine Sprosspilzkrankheit der Daphnien (Virch. Arch., vol. xcvii). See the author's papers on Erysipelas, in "Recent Researches on the Pathology of the Infective Processes," in Reports of the Med Officer of the Privy Council, &c., N.S., iii., 1874, p. 19.

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* Metchnikoff Ueber den Kampf der Zellen gegen die Erysipelkokken. (Virch. Arch., cvii., p. 209.)

There are three ways in which the question can be approached:—viz., (1) By ascertaining in what way the multiplication of microphytes within the animal body is affected by the intervention or exclusion of leucocytes; (2) by the direct observation of the changes which incorporated leucocytes undergo when watched under the microscope; and (3) by comparing susceptible with insusceptible animals as regards the way in which they deal with morbific microphytes when introduced into their bodies, it being understood that as regards the last question a distinction must be made between animals in which insusceptibility is acquired and those in which it is congenital, or, as more often expressed, natural. One of Metchnikoff's experiments consists in introducing under the skin of an insusceptible animal, the frog, a bit of liver or spleen of a rabbit affected with splenic fever. The bit, when examined a couple of days later, is coated with gelatinous exudation, full of leucocytes. These leucocytes were charged with bacilli, in various stages of degeneration.* If the experiment is done at the ordinary temperature, the frog is none the worse for the injection; but if it is exposed at the time and subsequently to a temperature of 38, the leucocytes, paralysed by so high a temperature, fail in their office, the bacilli get the better, and the frog inevitably dies. A much more exact experiment ef the same kind consists in introducing under the skin of the same animal a membranous tube made of the lining of the common large grass which grows on the banks of rivers (Phragmites), containing spores of bacillus anthracis.

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* Sur la Lutte de l'Organisme contre l'Invasion des Microbes. (Ann. de l'Inst. Pasteur, vol. i. p. 325, 1887.)

Soon the little tube fills with lymph, but contains no leucocytes, for to them the membrane is impermeable. A similar experiment is made at the same time with another tube, of which the ends were left open, so that the leucocytes could enter. In a day or two both tubes were examined. The contents of the closed tube swarm with virulent bacilli. In the open tube the spores have been so effectually disposed of by the leucocytes that the contents could be inoculated to susceptible animals without effect. The proof by direct observation that a leucocyte may contain living bacilli, or, in other words, that incorporated bacilli are not necessarily defunct at the time of their incorporation, either as regards viability or virulence, is obtained by a most ingenious method which I must describe. A "hanging preparation" of exudation, containing incorporated bacilli, is examined on the warm stage.* This done, a drop of nutritive bouillon previously placed on the under surface of cover-glass close to the drop of exudation is brought into confluence with it. The addition of the bouillon to the exudation kills the cell, but affords to the bacilli the required nutriment. In the course of an hour, during which the cell was watched under the microscope, the bacilli, by lengthening into filaments, had given unequivocal evidence that they were alive. But it might still be questioned whether they retained their virulence. This Dr. Metchnikoff settled by performing an extraordinary feat in microscopical manipulation. A cell which had been so observed was dextrously transported from the drop to another drop, in which it grew to a felt-work of fibres, and this was removed, eight hours after, into a cask of bouillon. Next morning this culture, the product of the bacilli contained in a single leucocyte, was used to infect a group of animals—to wit, a mouse, a guinea-pig, and two rabbits.

To be concluded.

THE Council of the College of Surgeons, England, have accepted the recommendations of the Board of Examiners in Dental Surgery, and will in future recognise the certificates of attendance in the practice of the dental department of the British Royal Infirmary.

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* Metchnikoff: Etudes sur l'Immunité. (Ann, de l'Inst. Pasteur, vol. iv. p. 65.)

Abstracts of British & Foreign Journals.

AN ACT RESPECTING THE PRACTICE OF DENTISTRY AND DENTAL SURGERY ON PRINCE EDWARD ISLAND.

(Assented to 15th July, 1891.)

Whereas it is desirable to regulate the practice of dentistry to the Province of Prince Edward Island.

Be it enacted by the Lieutenant-Governor, Council and Assembly as follows :—

1. This Act may be cited as "The Prince Edward Island Dental Act."

2. That no person shall practise the profession of dentistry or dental surgery in the Province of Prince Edward Island without having first received a certificate as hereinafter provided entitling him to practise dentistry or dental surgery.

3. That such certificate shall be issued by the Provincial Secretary, upon production to him of diploma of graduation in dental surgery from the faculty of any Canadian Dental College, or the faculty of any Canadian University having a special dental department, or from any such institution duly authorized by the laws of Great Britain or any of her dependencies or from any dental college in the United States of America recognized by the National Board of Dental Examiners of the said United States of America ; or from any recognized dental institution of any other foreign country which required at the time of issue of such diploma or license, attendance at a regular course of lectures, and an apprenticeship of not more than two years ; or a person who has been in regular practice in Prince Edward Island as a dentist or dental surgeon for a period of six months, immediately preceding the passing of this Act ; and it shall be the duty of the persons claiming to be entitled to the certificate required by this section to produce to the said Provincial Secretary evidence, satisfactory to him, of his being entitled thereto.

4. And it is further enacted that notwithstanding anything herein contained such certificate as aforesaid may be issued to any dental student who at the time of the passing of this Act was actually apprenticed to any surgeon dentist in

this Province, and who shall actually at the time of applying for such certificate, have served an apprenticeship of at least two years, and who shall also produce a certificate to the Provincial Secretary from such surgeon dentist testifying to the effect that the applicant was duly apprenticed before the passing of this Act for at least one month, and has at the time of application completed an apprenticeship of at least two years. Provided always, that nothing herein contained shall be construed to require physicians, surgeons, or others to take out such certificate for the purpose of qualifying them to extract teeth.

5. That before any such certificate is granted, the applicant shall pay the Provincial Secretary the sum of five dollars.

6. After three months from the passing of this Act, any person not holding a valid certificate issued by the said Provincial Secretary as aforesaid, who practises dentistry or dental surgery, except extracting teeth, shall be guilty of an infraction of this Act, and shall be liable upon summary conviction, before the stipendiary magistrate of the city of Charlottetown, or the stipendiary magistrate of the town of Summerside, or before any two Justices of the Peace for the county in which the offender resides, to a fine of not less than five dollars, nor more than twenty-five dollars, besides costs of suit, to be levied by distress of the defendant's goods and chattels, or in default thereof to be imprisoned for a period not exceeding one month.

7. That no person who has not received the certificate required by this Act, shall recover in any court of law any fees of money for any professional services, or operation performed by him, nor for any materials provided by him in the practice of dentistry, or dental surgery.

8. That nothing in this Act shall be construed to prevent surgeons or physicians from temporarily filling teeth or otherwise attending to them, for the prevention or cure of toothache.

Dominion Dental Journal.

TEMPORARY SETS.

In making temporary sets of teeth immediately after extracting, it is much the best plan to insert the six or eight anterior teeth into the gum, where the natural roots were, to a depth of about one-third of their length. Set in this way they look more natural, first, last, and all the time, and fit better when the gums have shrunken to any considerable extent. It is, however very difficult to decide precisely where to cut into the cast for the insertion of some of the teeth, as the loose edges of the gums turn inward and obscure the outline of the alveolus when the impression is being taken. This can be partly remedied by trimming away such parts of the gum as will be too much in the way. Sometimes the prominent points of the alveolus must also be trimmed to allow a satisfactory adjustment of the teeth. All the foregoing is "old" in my practice. The next step is new. After trimming gum and alveolus take rolls or pellets of softened wax of the same diameter as that of each tooth or root, and insert nearly half way up the socket, and cut off one-fourth of an inch from the edge of the gum, and while thus in place, take the impression with plaster in such a manner that each piece of wax will come away with the plaster. Where the wax has been pressed into the alveolus further than we wish to insert the teeth, the points must be trimmed away so they will make sockets in the casts only as deep as the teeth are to be inserted. When this is done carefully, the teeth will fit accurately into the gums, aud not impinge on the process on any point, as they are very likely to do without such a guide for their adjustment. This plan is best for lower sets sometimes as well as upper if the gums protrude badly. Where a single tooth is to be inserted between two long bell-shaped or flaring teeth, immediately after extracting, it is much better to place a piece of wax to fill the gap, so as to come away with the plaster impression. This overcomes any objection to plaster for such impressions, and nothing else is so reliable for the purpose. The depth in which the teeth are inserted into the alveolus will influence the amount of shrinkage that will take place in the gum and alveolus. If inserted quite deep, the length and prominence of the gum will be diminished, a thing at times very much to be desired. Or, if little or no shrinkage is desired, then gum teeth should be used for the temporary set. It is better there should be no temporary set than to have such hideous sights as are sometimes presented.—Dr. W. E. DRISCOLL.

Items.

MYCOSIS ASPERGILLINA OF THE ANTRUM OF HIGHMORE.

Zarniko (*Deutsch. Med. Woch.*, October 29th, 1891) records a case of mycosis aspergillina of the antrum. The patient, a woman, aged 50, complained of nasal obstruction, with an offensive and copious nasal secretion, frontal headache and an occasional sense of fulness in the left ear. Rhinoscopy showed that both middle terminated bones were occupied by irregular tumours attached by a broad base, and almost filling the middle meatus of the nose. On the left side, moreover, was some creamy highly offensive pus, occupying the middle meatus and covering the upper surface of the lower terminated bone. This pus could be made to ooze freely if the tumour was pushed toward the septum with a probe. The soft palate was shortened by cicatrisation and drawn up and especially on the right side, radiating cicatrices being also visible on the hard palate and pharynx. Zarniko removed the tumours by means of a snare, and as soon as the wounds had healed passed a curved tube into the left antrum of Highmore, and syringed it out, removing in this way a number of dark brown (more or less friable) lumps as large as peas. On microscopic examination these lumps were found to consist of a fungus presenting all the characters of aspergillus fumigatus (Fresenius). The antrum was regularly washed out with boracic and corrosive sublimate lotions, rapid improvement taking place. The lumps disappeared, together with the offensive smell ; the discharge of pus also greatly diminished. Zarniko considers this disease to belong to the same category as otomycosis. The mucous membrane of the antrum, when healthy, is probably unsuited to be a soil for the aspergillus, but, in this case, it may possibly have become suited as a result of serous catarrh, the growth of the fungus provoking and maintaining the inflammatory condition observed. Zarniko recommends that the disease should be attacked through the middle meatus. This method is simpler than any other.

British Med. Jour.

PREPARATION OF TUBERCULIN.

Dr. Kock gives the following information as to preparing tuberculin. It is generally understood that tuberculin is a product of the cultivation of tubercle bacilli obtained in the form of a glycerine extract. As may be supposed, a principal difficulty has been the cultivation of the bacilli free from admixture with other organisms. Originally the tubercle bacilli were sown upon "glycerin-peptone-agar," and when the culture had attained its full development it was washed off, collected on a fine wire gauze, extracted with a 4 per cent. glycerine solution, the solution evaporated to one-tenth, filtered, and the filtrate used. When a large demand arose for tuberculin the agar cultivation was found unsuitable, as it gave relatively small results. A previously abandoned attempt to cultivate the bacilli in a liquid medium was therefore resumed, but at first without success, until some small flat pieces of cultivation which had been left dry and unmoistened in the upper part of the flask were observed swimming on the top of the liquid, where they developed most luxuriantly. In the course of a few weeks they formed over the entire surface a tolerably thin whitish skin, dry on the upper side, which eventually became moistened, broke up and sank to the bottom. The product from such a culture proved considerably greater than that developed on solid media. The cultivation liquid used is an infusion of veal made faintly alkaline and with 1 per cent. of peptone and 4 or 5 per cent. of glycerine added. The bacilli sown give practically the same results, whether taken from fresh or old cultivations, from a tuberculous patient, or after passing through a series of animals. When the culture is quite mature, which occurs at the end of six or eight weeks, and has been ascertained to be absolutely pure, it is extracted by means of the cultivation liquid itself, and the extract is evaporated on a water bath to one tenth of its originnl volume and filtered through porcelain. It then contains from 40 to 50 per cent. of glycerine, and is tested as to its activity by experiments upon guinea-pigs.

Pharmaceutical Journal.

STORAGE BATTERIES.

By H. A. Allen.

The simplest form of storage battery consists of two lead plates placed parallel to each other in a jar containing dilute sulphuric acid. If now, a current of electricity from some electric generator be passed from one of the plates, through the medium of the water to the second plate, and thence back to the generator, it will be found that the combination of lead plates and acidulated water possesses a property not before noticeable. On connecting the lead plates to an instrument used for determining the flow, and amount of flow of an electric current, it will be found that a current of electricity is given out by the plates in a reverse direction to the current from the electric generator. In other words, our plates have changed their state and now act as a source or generator of electricity. Thus we see that the kinetic energy of the generator current has done a certain amount of electro-chemical work upon our plates, and given to them a potential energy that remains stored up until, by completing the external circuit from plate to plate, we destroy the equilibrium and obtain a consequent flow of current, and in a direction necessarily opposite to that of the original source.

We now understand what is meant by secondary batteries, accumulators or storage batteries.

The combination of the lead plates, acidulated water (electrolyte), and enclosing vessel is generally known as a cell. The combining of two or more cells forms what is usually known as a battery, although the term battery is often applied to a single cell. The amount of energy that can be stored up in a single cell depends (other things being equal) upon the extent of surface of the plates. The electromotive force, or electric pressure of a single cell, is for all practical purposes two volts, a fact often overlooked even by expert electricians. It is absolutely necessary to have sufficient electric pressure in order to force the necessary amount of current through the apparatus used.

In other words, if it is required to have an electro-motive force of six volts, as one cell gives but two volts, it will take three cells to give the required pressure, no matter what the ampere hour capacity of the cells may be. In the market there are many forms of storage batteries, each one claiming to be the best. It is therefore necessary, in order to get a good battery to have some idea of what qualities a good battery should possess. The following are points to be noticed in selecting a storage battery :

Efficiency, in regard to capacity in ampere hours in proportion to size and weight. Convenience, in regard to charging, and to transporting. Durability, in regard to liability to injury from overcharge or discharge, and in accidental rough handling. Cost, after having examined into efficiency, convenience, and durability. Having decided upon obtaining a storage battery, you must now decide how you will charge it, that is, put work into it. If you have electric light in your office it will be no trouble to obtain your charging current. It is here that a great advantage for the storage battery lies. It may be that you have only a night circuit in your office. If so, the storage battery can be charged through the night, or at such other times as the electric light current is on. It may be that there is no electric light in your Office, but there is an electric light station in the city where you live, a quarter of a dollar will probably pay the station man for the trouble of charging the battery for you, expressage not considered. In this case it wil pay you to have three or four large cells, as then you will not be obliged to charge so often. If no electric plant is near you then you may resort to primary batteries to charge the storage cells. There are several very neat arrangements for charging storage batteries by this method which has an advantage for simplicity, convenience and cost. One of the neatest means of charging a battery of one, two or three cells is by means of a thermopile, a method at present but little used, owing to its apparent expensive first cost. In purchasing a battery all directions for use will be given ; and owing to certain advantages, that I shall show later on, no matter by what method you charge the storage battery is a great convenience for the doctor and dentist.

One cell in a battery is sufficient for lamps used in instruments for examination of throat and eyes. For electric cautery, two cells are generally sufficient for ordinary sized loops. Electricity has lately come boldly to the front as a great surgical and medical agent. For dissolving ulcers, destroying the nerves of the teeth, curing toothache, electricity is without a rival. For extracting steel or iron from the eye, examinations for translucency in cystic tumours, for faradization, electrolysis, galvanocautery, a two-cell storage battery is sufficient. The great advantage that the storage cell has for this kind of work is its great constancy in electro-motive force. If not over discharged the storage cell gives practically a constant electro-motive force of two volts.

For convenience in carrying, small two cell batteries are made; but for office work, for running motor for dental engine, etc., it will be more economical in the end to have two or three large cells. The time allotted me for this paper has but permitted me to skim over this subject, which is really a very extended one.

There is soon to be put on the market a much improved battery which is especially adapted for medical and dental work. But, at present there are two or three makes of storage batteries that will give good results in practice.

It is necessary in order to obtain good results for all around work to have a rheostat connected with the cells. This allows you to vary the amount of current taken from the cells.

Dental Review.

GUTTA-PERCHA.

By Rodriques Ottolongui, M.D.S.

No dentist can afford to be without this most valuable material. Useful in many ways, it is perhaps most useful for temporary purposes. In the form known as "temporary stopping" it is immensely valuable. This is a combination mainly of gutta-percha and wax. Of those obtainable at the depots I prefer Gilbert's, because it has just the right proportions of the two materials. Those which have more wax are not as durable, and become too soft and sticky when warmed. Thetemporary stopping is furnished in two colours, presumably that the white may be used in conspicuous positions. There is a much better advantage to be taken of the two colours. The pink should be used only to cover arsenical dressings, or in such teeth where the condition demands that attention should be given to the tooth at the next sitting. The white becomes useful for teeth whose root-canals have been filled, or any other condition where it is not absolutely essential that the particular tooth should be operated upon immediately, to the exclusion of other possibly urgent cases. Thus, when a patient presents, a glance in the mouth tells much. A temporary filling, white in colour, the dentist may set aside for the time; but a pink one acts as a signal, which would mean that delay would be dangerous.

A temporary purpose, which is served by gutta-percha plain, better than when in combination with wax, is where a patient presents with a number of dangerous cavities; teeth in which a pulp-exposure may occur at any time. It is impossible to fill them all at one sitting with permanent materials. It is very wise, however, to cleanse them all of decay, and fill with gutta-percha. Thus all is made safe at once, and the permanent fillings may be placed at leisure.

As a permanent filling, gutta-percha may frequently be depended upon. Either the white or the pink may be used, but my experience has been that the pink is more durable; therefore, in conspicious places, it is to be preferred. Much of the reported failure of gutta-percha as a permanent filling may be referred to faulty manipulation, or injudicious choice of the cavity in which to place it.

So far as manipulation is concerned, the common practice of heating the material in the flame is ruinous to all hope of permanency. It should be heated on a porcelain disk held over the lamp, or preferably over warm water on a glass tray. A special apparatus of this kind is purchasable. In placing gutta-percha in a cavity, should the cavity be a large one, it may be packed piece by piece, thus insuring adaptation to the walls, until two thirds of the cavity is filled. Then a single piece large enough to complete it should be used. In smaller cavities a single piece should be chosen large enough to slightly more than fill the cavity. After the filling has cooled and is hardened, the surplus should be trimmed off with a thin smooth burnisher, or spatula, slightly warmed, care being used not to drag the material away from the walls. In a few instances, as up under the gum margin, I have used to advantage a tape dipped in chloroform.

Places where gutta-percha is positively indicated, are extremely sensitive cavities along buccal, palatal, or lingual surfaces, especially where they extend wholly or in part below the gum margin, in molar teeth. Here the pink variety is to be preferred. Where teeth have been worn by ill-fitting clasps, so that cavities filled with leathery decay have been formed, which, when cleansed, leave exposed hypersensitive dentine, they are more likely to be cured with gutta-percha than with any other material. It is better to be obliged to renew the fillings periodically, than to risk death to the pulp by using a metal. Gutta-percha is not a non-conductor, but it is a poorer conductor than the metals, and what is more important, all the tissues of the mouth, whether hard or soft, are singularly tolerant of it. Occasionally a patient will present with a deep cavity in a most inaccessible approximal surface. Excavation makes it doubtful whether the pulp is nearly approached, or whether hypersensitive dentine alone is the cause of the pain. A very wise course is to temporize by inserting gutta-percha. Too much examination may expose a pulp in a small cavity, thus necessitating a tremendous sacrifice of tooth-substance for its proper removal, whereas under a gutta-percha filling this class of teeth is frequently troublesome no longer.

Gutta-percha is often used as a capping over pulps which are nearly approached. Where this is done, and the filling completed with gold, common sense will indicate the advisability of covering the gutta-percha with a resistant body of oxyphosphate before attempting to pack gold upon it. Many however, would not think this essential where amalgam is to be the final filling. It must be remembered that gutta-percha is slightly elastic. Therefore, where it underlies amalgam or other metallic filling, it must not be so placed that the superincumbent filling rests wholly upon it.

A solution of gutta-percha in chloroform, commonly known as chloro-percha, is useful for lining cavities before inserting a filling of oxychloride, thus preventing the pain from irritation by the chloride of zinc. It is also valuable, and should always be used as a coating for oxychloride or oxyphosphate fillings where the latter are meant to serve permanently.

Cosmos.

A STRANGE CONDITION. DID ARSENIC PRODUCE IT?

A few months since, a small woman with fairly good health presented herself in my dental chair.

I found that the crowns of eight molars had been lost by decay to such an extent that I extracted their roots separately and easily.

Two incisor and one canine tooth of the lower jaw, were crownless and pulpless. Three bicuspid and two incisor teeth of the upper jaw were also crownless and pulpless. These eight teeth I have since supplied with artificial crowns.

The crowns of the other two upper incisor teeth were pulpless, and nearly half destroyed by decay, but their contours have been restored with annealed gold under the mallet.

The crown of the fourth upper bicuspid was pulpless, and half destroyed by decay. It is now filled with oxyphosphate of zinc. My astonishment over this pulpless condition was greatly increased when informed by the patient that she never had toothache in her life! Half the crown of the right inferior first bicuspid was restored with gold foil.

A large gold filling was inserted in right superior first molar. In preparing the last two teeth mentioned, excavations in the dentine could be felt, but produced no decided pain. Gold fillings were inserted in several other teeth where there was no sensation in the dentine whatever, but as the teeth were firmly set, of good colour, and surrounded by healthful tissues, I did not open into their pulp chambers. Another excuse for not doing so, if apology seem to be necessary, that with all these bad teeth, she has never had an alveolar abscess! My curiosity was so great as to induce me to institute a careful inquiry concerning the woman's history and habits. In October, 1880, her condition was such as to cause her to consult a physician, so called. "The Doctor" prescribed "Fowler's solution." This the patient took in "six drop doses," three doses each day as directed, without any knowledge or suspicion of the *nature* of the solution.

Getting no better, "the doctor" was again consulted, and repeated his prescription. After weeks of perseverance in the use of the medicine, new and troublesome symptoms arose.

The number of the prescription being on the bottle, the medicine was procured of the druggist and taken with punctuality for months; the patient constantly growing worse, until, for the last six weeks of its use she was confined to her bed, in a darkened room, with inflammation of the conjunctivæ, suffusion of eyes, feet and ankles swollen, general anasarca in fact, and stomach too irritable to retain any solid food. In short, she was dangerously ill from slow arsenical poisoning, extending over a period of eight months; from October, 1880, to June, 1881.

She reports that her teeth were all sound at that time—ten years ago.

As there is no effect without a cause, the question for consideration is to determine the cause of such extensive devitalization.

The fact that arsenic is made use of for the destruction of pulps, by virtue of its caustic effect when locally applied, will throw no light on this case. For months the whole system was saturated with arsenic and the vital powers greatly depressed in consequence. The usual symptoms of slow arsenical poisoning were present. That the coats of the blood vessels were enfeebled, collapsed, was sufficiently proved by the general anasarca. The congestion of the capillary blood vessels and effusion into the cellular tissues about the eyes, in this, as in other cases, was well marked, and one of the earliest symptoms. A similar congestion in, and effusion from the capillary vessels of the pulps of the teeth, must have taken place. From the intolerance of food and general functional inaction, the whole system suffered from deficient nutrition.

The privation of nutrition from the pulps may have been greater than any other portion of the system. Both anatomical and mechanical causes can be assigned for this opinion.

The congested condition of the capillaries may have been such as to greatly restrict and finally entirely to intercept the flow of nutriment through the small and unyielding apical foramina. The arsenical solution was taken for eight months, and the process of destruction of the pulps may have continued for many months, or even years, longer. Indeed, the diminished sensibility of the dentine in teeth recently filled, indicates that the process of devitalization is still at work.

This slowness of destruction has given time for the disposition of the products of decomposition, through the process of absorption and elimination, as the result of increased glandular activity. Certainly, this very strange condition had a cause. If the above history and suggestions throw no light upon it, will some one, better qualified, give us the true solution?

Ohio Journal.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The last Ordinary Meeting of this Society was held on Friday, December 4th, at 8 o'clock. By Denison Pedley Esq., President, in the chair.

The minutes of the previous meeting were read by the Secretary and confirmed.

CASUAL COMMUNICATIONS.

Mr. Arnold Prager mentioned a case he had lately seen. A child, aged seven years, was brought to the Hospital with a tumour situated between the temporary canine and the second temporary molar on the left side of the lower jaw. The tumour was dark in colour, about an inch in length, and overlapped the gum on the labial and lingual surfaces. It was indented where it had come in contact with the upper teeth.

The case was examined by Mr. Roughton, who diagnosed it as a myeloid tumour. This being the only casual communication a general discussion took place.

The President stated that from long experience in the examination of children's mouths. he came to the conclusion that tumours of the gum were uncommon. When such an one was found it was not at all rare to see on microscopical examination many multe nucleated or myeloid cells so characteristic of myeloid sarcomas. A myeloid sarcoma was looked upon by pathologists as a malignant tumour, owing to the rapidity of growth and the secondary deposit in other parts, but when occurring as an epulis in young children, there was every reason to believe that it was an innocent tumour.

Mr. Faro was then called upon by the President to read his paper on "Notes of Some Cases in Practice."

A discussion of a very interesting nature followed, the President, Dr. Maughan, Messrs. Humby, Rushton, Clarke, Arnold Prager, and Reginald Bascombe taking part in it. The President in speaking thanked Mr. Faro for so willingly coming forward to read a paper, and also in his choice of a subject, stating that it would be to the benefit of everyone, if old students now and then read a paper before the Society dealing with any exceptional cases that came under their notice.

The meeting was then adjourned till Friday, January 8th, the Annual General Meeting, when the President will deliver his Valedictory Address.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual Monthly Meeting of the Manchester Odontological Society took place at the Victoria Dental Hospital, Grosvenor Street, on Tuesday evening, the 1st inst. Mr. J. Renshaw, President, was in the chair.

Applications for membership were read from Messrs. Armitage, and Buckley, and Mr. J. Taylor, of Manchester, was ballotted for, and elected a member.

CASUAL COMMUNICATIONS.

Mr. G. O. **WHITTAKER** showed an improved bottle for holding mastic or carbolic acid, in which the lid of the bottle fitted on the outside, instead of inside, as was usually the case.

Mr. E. P. **COLLETT** exhibited a model showing the pernicious effects of injudicious use of elastic bands, by which the tooth was almost drawn from its socket, also some well marked syphilitic or Moon's molars, extracted from a child of 14, who was dwarfed and suffered from syphilitic keratitis and was the subject of purulent ozæma; he also exhibited photographs, taken by Mr. G. G. Campion of the same teeth, side by side, with normal molars.

Mr. **MASTERS** showed an electric hot-air syringe, electric operating-room lathe, motor, &c., which were much admired.

The members then separated to watch several practical demonstrations, which were as follows.

Mr. **PETER HEADRIDGE** filled a large crown cavity in a lower molar with gold, using a succession of towels to keep away moisture, in the manner usually employed before the introduction of rubber dam.

Mr. J. **RENSHAW** showed the method of casting cheoplastic lower dentures.

Mr. W. **SMITHARD** administered N_2O to some half-dozen patients by means of his new apparatus, while Mr. W. A. Hooton, performed the necessary extractions.

Mr. G. O. **WHITTAKER** inserted some porcelain-rod Inlays in Upper Incisors.

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SENSITIVE DENTINE.*

By J. C. Lingford.

Mr. President and Gentlemen,—The teeth, unlike the other dermal appendages, as the hair and the nails, exhibit signs of sensibility in one of their component tissues, viz., the dentine. This fact presents itself to us regularly whilst pursuing our conservative efforts; sometimes at eroded spaces, sometimes where the enamel has been worn down by attrition, but most frequently when attempting the excavation of decayed dentine. When the protecting enamel has been removed by caries, the underlying dentine is often found so tender to the touch of an excavator as to be unbearable by the patient. This is one of the reasons that sometimes makes the visit to the dentist dreaded so much, and causes so many people to neglect having carious teeth treated. Many persons, however, suffer the removal of carious dentine without showing the slightest indication of pain, or, as Mr. L. P. Meredith expresses it, "One patient will take his seat in the dental chair, and have his teeth probed, drilled, burred, excavated, and hammered for hours retaining his composure with stoical indifference, and, possibly, going to sleep, while another, whose teeth are not nearly so badly decayed, will wince at the slightest touch, and writhe in agony at the necessary application of power, pronouncing the pain unbearable, and refusing to submit to further manipulations."

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* Read before the Students' Society, of the Victoria Dental Hospital, Manchester.

In enquiring into the cause of this sensitiveness, it will be necessary to briefly allude to a few points regarding the structure of human dentine.

Dentine consists of a hard calcified matrix, permeated by fine tubes or channels, from 1-4500th to 1-10000th of an inch in diameter, which run at right angles to the surface of the tooth ; each tube is occupied by a process of a protoplasmic nature termed "the dentinal fibril," these fibrils being in intimate connection with the tooth pulp, and are first concerned in the formation of the dentine, afterwards having a nutritive function. The manner in which the connection of the dentinal fibrils with the nerves of the pulp is effected, has not yet been definitely settled, the structure presenting great difficulties to histological research, so that various theories are held by different observers.

Boll, by treating a tooth pulp with a dilute solution of chromic acid, found on the surface a great number of fine non-medullated nerve fibres, which he traced and found to be continuous with the larger medullated ones. These nerve fibres he found to pass through the membrana eboris and take a direction parallel to that of the dentinal fibrils, which led him to infer that they had been pulled out of the dentinal tubes, but it cannot be said that Boll or any other observer has ever seen a nerve fibre actually pass into a dentinal canal.

Magitot asserts that the fibrils are prolongations from the odontoblast layer of cells, the odontoblasts becoming continuous with the nerves of the pulp by means of the underlying stellate cells ; while Klein differs from this by holding that the fibrils are prolongations from the stellate cells, which run up *between* the odontoblasts. No satisfactory conclusion as to the termination of the nerves of the pulp has yet been arrived at, though Magitot is fully satisfied as to their becoming continuous with the stellate cells : they are rather indefinitely described as ending beneath the odontoblast layer in an interlacing network termed —"the plexus of Rashkow." Thus, we can only say that the dentinal fibrils if not in actual continuity with the nerves of the pulp themselves, are, nevertheless, in intimate connection with that organ, to which they are capable of transmitting impulses when irritated. From this it is to be inferred that a certain degree of sensibility of the dentine may be regarded as being perfectly normal, but the condition of exalted sensibility is to be regarded as pathological, the term "sensitive dentine" of course may apply to both these conditions, but custom has limited its use to the hyperæsthetic state only.

The cause of this hyperæsthesia is described by Harris as being due to inflammation, but there is little support to this theory, and it is difficult to conceive such a condition in a hard and unvascular structure like the dentine.

Taft, also strongly upholds this inflammatory theory, he says, "the condition of the teeth is always affected by a general inflammatory diathesis, local treatment in these cases commonly being inefficient, a modification of such a condition of the system producing a change in the affected teeth;" he also mentions that persons of a plethoric or a strumous habit, and those in a febrile condition as being peculiarly predisposed to this affection, and that teeth of females are liable to be affected during any uterine irritation, doubtless in such cases as these, the oral secretions have a great deal to do in influencing the dentinal sensibility. The relative density of structure in different cases, undoubtedly is, a cause of varying sensibility, dentine of soft structure being generally found more sensitive than that of hard structure, caries exposing a greater amount of organic fibre in these cases.

Mr. Arthur Underwood has shown that where extreme sensibility exists, it may, in rare cases, be traced to the existence within the tissues of what he styles—"aberrant filaments"—anomalous nervous filaments, radiating from the surface of the enamel (Sewill.) Another supposition is, that this affection is dependant on a peculiar state of the pulp itself, sensibility being totally lost on the devitalization of that organ. With regard to the function of sensation in the dentinal fibrils. Mr. Coleman assigns to them a special sensory property similar to that of touch-corpuscles &c., which renders them capable of ascertaining the nature of bodies which come under their action and also of judging when those bodies are properly comminuted, to this latter he adds the interesting note that people who have artificial teeth at first find considerable difficulty in judging when their food has had sufficient mastication.

Mr. Keevil, in a paper on this subject, says—"It is suggested that the most likely use of the sensation is to give warning of the encroachments of caries and to be connected with the throwing out of secondary dentine."

I will now pass gentlemen, to the most important part of my subject, viz—the practical treatment of this condition in connection with the preparation of carious cavities.

People very often complain of pain in carious teeth, where the decay is only very superficial and where there are no signs of pulp complication, this is generally caused by the exposed dentine being sensitive and irritated by either contact with the air or such agents as sugar, salt and vegetable acids, which are taken into the mouth, almost invariably a dressing of carbolic acid covered with a mastic plug will give relief, after which the tooth should be permanently treated. Many cases come to us for treatment where the decay is not at all deeply seated and where no pain has been experienced, we chip down the enamel wall and proceed to excavate and it is then that sensitive tissue is found, sometimes we find only a thin layer sensitive, sometimes the whole of the discoloured dentine is tender, or sensibility may not be experienced until we are shaping our cavity by cutting into the healthy tissue ; some situations are found invariably tender, for instance, labial cavities in incisors. Harris says, " we may always expect sensitiveness at the union of the dentine with the enamel, for the reason that at this point the fibrils terminate."

It is sometimes difficult to distinguish between really sensitive dentine, and dentine made sensitive by force of imagination ; many people, especially nervous females and children, when visiting the dental surgeon for the first time, generally go with feelings of apprehension, and the fixed idea that they are going to be hurt, and will try and make you believe that you are torturing them merely by examining their mouth with a mirror, to say nothing of what you do when excavation is attempted.

Forceps and a lot of instruments left lying about in an ostentatious manner does not serve to dispel their fears. With patients of this class, a calm and reassuring manner goes a long way. Operate on the simplest case first in as gentle a way as possible ; by doing this the patient's confidence is gained, and future visits are looked to, if not exactly with pleasure, at any rate without feelings of alarm.

Also, be careful to distinguish sensitive dentine from the pain which arises from irritation of a pulp when closely approached by decay, especially in those cases where caries has converted a layer of dentine over the pulp into a cornified elastic state ; each stroke of the excavator on this tissue makes pressure on the pulp, causing pain which one is very apt to put down to the dentine.

Blunt excavators, used with a scraping or a levering action, often cause unbearable pain, whereas if the instruments are thoroughly sharp, as they should be, and are made to *cut* in a direction *from the pulp*, this will not be the case. Sometimes the dentine is very sensitive when first touched, but becomes less so after a little time. Often when cutting in one direction, say, right to left, the pain is unbearable, when the motion is reversed, left to right, it becomes endurable, or sensation is entirely lost. Where the dentine is so abnormally sensitive as to make excavation unbearable, and where the patient flinches at the use of the dental engine, the operation must be suspended, and some of the remedial agents to which we have access should be applied. The selection of these will depend upon the intensity of the pain experienced, upon the tooth, and depth of the cavity under operation.

The various agents used in the treatment of sensitive dentine may be classed under three principal heads, viz.:—

1. Those which act by dehydration of the tissues.
2. Applications which act medicinally on the fibrils.
3. Temporary fillings.

The first of these, Dehydration of the cavity, is usually a very effective method of treating sensitive dentine. The rubber dam is first adjusted to the tooth under treatment in the usual manner, the superficial moisture is then removed with amado or bibulous paper; next, a pledget of cotton wool saturated with absolute alcohol is placed in the cavity and allowed to remain for a few seconds, the affinity which alcohol has for water causes it to abstract this element from the tissue, it also causes an increased density and firmness of the dentine by coagulating the soft fibrils; blasts of warmed air are then projected into the cavity, for this purpose the ordinary chip syringe may be used, the air being heated by holding the nozzle over the flame of a spirit lamp, a better instrument is the special "hot air syringe," which has a copper cell for heating continuous with the nozzle, Dr. Register uses a storage reservoir containing compressed air warmed up to body temperature, india-rubber tubes carrying the air to the tooth on which it is to be applied. The first blast of air should be only just warm and should be cautiously applied, as it sometimes causes intense pain; at first use the warm air gently with intervals of 2 or 3 seconds between each blast, and as the pain diminishes, the force and temperature may be increased, and the intervals dispensed with.

If sensibility again occurs after the operation has been proceeded with, excavation should be suspended and the warm air re-applied. The loss of sensibility of the dentine when treated in this manner is due to the dessicating effects of ordinary atmospheric air, under which condition the abstraction of moisture from the tubuli and the consequent inhibition of functional activity on the part of their protoplasmic contents, being so gradual, as to cause little, if any, suffering (American System, Vol. 3). I will now briefly run over a few of the principal agents used for obtunding sensitive dentine.

Creosote or carbolic acid, preferably the latter, applied to the surface of the dentine on wool, is very efficacious, especially in treating childrens' teeth ; its action is much more certain and rapid, when applied after the use of the hot-air syringe, as the agent then enters the tissue more deeply. It acts on the dentinal fibrils by its power of forming insoluble compounds with albuminous matter, and, according to Dr. Flagg, slightly anæsthetizes the pulp.

Another good obtundent, and one very rapid in its action is Chloride of Zinc. It is necessary to have this agent pure, and a few of the undissolved crystals should lie in the bottle containing the saturated solution. In applying this, the tooth under treatment should be dried, and protected from the ingress of water preferably by the rubber-dam, a pledget of wool saturated with the liquified salt is then placed in the cavity, or, where convenient, it has been recommended to place a small crystal in the cavity and allow it to deliquesce there.

A dull and sometimes severe pain is experienced on the application of this escharotic, which soon abates however ; it may be diminished by applying carbolic acid previously and Gorgas recommends the application of chloroform, tincture of aconite or atropine solution prior to the use of the chloride.

As soon as the pain it causes has passed away, the operation can be proceeded with, 2 or 3 applications generally doing away with all sensibility. Although its action is superficial, it should only be used in shallow or moderately deep cavities, if used in very deep cases the pulp is endangered.

Arsenious acid is said to be a sure remedy for treating sensibility, a minute quantity, $\frac{1}{30}$ to $\frac{1}{40}$ of a grain, is sealed in the cavity and left for 1 or 2 hours, after which the dentine is found to be entirely devoid of tenderness. Arsenic, however, possesses a most serious objection, viz : producing death of the pulp owing to this it is very rarely used, it only being permissable as a last resource in shallow cavities, it should never be used in teeth ot soft texture and teeth of young persons.

Minute quantities of arsenic, even when used dry, as Tomes directs, appear to have the power of devitalizing the pulp even through a moderately thick layer of dentine ; death of the pulp may result in a few weeks, or perhaps months, the patient returning with some disturbance consequent on putrefaction of the pulp, necessitating the tooth being opened up and the roots treated ; although used with the greatest of caution, this most undesirable end is likely to be brought about, therefore its use, notwithstanding its seductive certainty, is strongly to be deprecated, its application for this purpose being considered "bad practice" by many operators. The Monoxide of Cobalt has been used on account of the arsenic it contains, on the supposition that it is not absorbed so readily as the arsenious acid itself when employed for the same purpose.

A strong solution of Tannin either in alcohol or carbolic acid is a useful application for allaying sensitiveness, or Mr. James Stocken's formula :—

R. Acidi Tannici ʒ II.
Tincturæ Arnicœ ʒ II.
Tincturæ Myrrhæa d. ℥ I.

will be found beneficial, these tannin preparations having a hardening action on the dentine by virtue of their strong astringent powers acting on the fibrils.

Eucalyptis oil is often found very efficacious on account of its astringent and anæsthetic properties. A special apparatus for obtunding sensitive dentine produced by the firm of Messrs. Simonis was shown and demonstrated with success at the Berlin Congress of 1890, by means of which a fine spray of vaporized alcohol is allowed to play on the cavity. Another agent for producing local anæsthesia is Chloride of Ethyl, this is now conveniently put up in glass flasks one end of which is elongated into a capillary tube with the end sealed, to apply, it is only necessary to break the end of the fine tube and the heat of the hand vaporizing the drug a fine jet is projected into the cavity, this has been highly spoken of by some of our Transatlantic brethren.

Great things were expected of cocaine, but experiments with it on dentine have been rather disappointing, by mopping the cavity out with a 20 per cent. solution of the hydrochlorate, a beneficial end sometimes results ; and Dr. John S. Marshall found that by applying a solution of *citrate* of cocaine from about five to ten minutes, the preparation of a sensitive cavity could be gone on with. The application of electricity deserves further trials and experiments, Dr. Flagg has found that by placing one pole from a galvanic battery in the carious cavity, and the other on the gum over the root of the tooth, sensibility was greatly diminished, a more marked result being brought about by tipping the poles with moistened sponge. The rather rare cavities produced by erosion are often very sensitive to the touch of an instrument and alterations of temperature, and at considerable force has to be applied to cut into the hard polished surface of the dentine, in these cases, a considerable amount of pain results.

Nitrate of Silver applied to the eroded surface is the best remedy for these teeth, its only fault being the objectional black stain caused by the oxide of silver, (which is formed on the reduction of the nitrate), being precipated in the cavity. It is used either in the solid form, or in a saturated solution ; when applied solid, it may be manipulated with greater facility and safety when fused on a platinum wire, as fracture of the stick caustic in the mouth might prove dangerous Its use in front of the mouth is inadmissable owing to the black stain, therefore in eroded front teeth, repeated applications of zinc chloride in the solid form should be tried.

When, notwithstanding the careful applications of remedial agents, it is still found impossible to finish the operation at one sitting owing to the pain caused, a temporary filling should be inserted. The filling used for this purpose should be a non-conductor, non-irritant, and one fairly easy of removal, some are used on account of some therapeutic property they possess, and some merely as plugs to protect the dentine from contact with irritating substances, &c. Thus, the oxy-chloride of zinc is a valuable temporary filling, as it generally contains a little free zinc chloride when inserted, which acts on the dentine ; or the oxy-sulphate of zinc, the preparation known as "Fletcher's dentine," being the best, is used on account of its astringent action, whilst gutta-percha and zinc phosphates are used solely as plugs. If the sensitive tooth is treated by the insertion of one of these fillings and left for two or three months, all irritation will be found to have subsided at the end of that period, and the tooth can be permanently treated without causing the patient the slightest discomfort.

In concluding this rather fragmentary paper, gentlemen, I must say that I have not been able to offer you any new ideas on this subject, but if I have succeeded in promoting a good discussion, I shall have the gratification of knowing that I have not taken up your time in vain.

COMBINATION FILLINGS.

By J. R. Callahan, D.D.S., Cincinnati, O.

For sometime I have been deeply impressed by the seeming tendency, shown by many of the leading lights of our profession, to the utter abandonment of things practical for things scientific, so-called. For a time the energies and best thoughts of these men were directed toward the practical things in hand, and *at the same time* they did not fail to recognize the scientific , and while working under these conditions they pushed American dentistry to the front and compelled other nations to acknowledge their superiority. As an indication to the tendency of the times, I read in one of our journals not long ago an article congratulating the profession at large upon the fact, that at a recent dental society meeting that not a practical paper or discussion was heard ; that the whole time had been devoted exclusively to scientific subjects. To all of which I say, Amen, if kept within proper bounds. There is in my mind *no doubt* as to the propriety of devoting the whole of the time, of such societies as the American Dental Association, to scientific discussions and demonstrations. But our state societies should, in my opinion, divide the time somewhat and discuss and *demonstrate* the things of every day practice. Our hyper-scientific men, especially those who ape European practice, seem to have forgotten that there is any necessity for doing practical things thoroughly and up to the highest standard. They seem to forget that their *principal* mission is to save teeth, at least a look into the mouths of their patients would lead a conscientious operator to think so: for this reason, be it real or imaginary, when your committee called on me for a paper I concluded to direct your attention, *in a very general way*, to combination fillings.

Human opinions and methods seem to swing as a pendulum, from one extreme to the other, until, after a lapse of time we are compelled by results to seek the middle ground where we may look upon all sides of the problem in hand, thereby be enabled to recognize that which is good and discard that which is bad. Many of you can remember when fillings were all plastic or non-cohesive. All of us can remember when cohesive fillings were the rage. To-day the man who confines his practice to either extreme may be said to be a one-sided dentist. We seem to have found the middle ground in this department, and are doing our patients and our profession better service than ever before.

For our purpose to-day, combination fillings will mean a combination of amalgam and gold, tin and gold, and of cohesive gold and non-cohesive gold.

It is well known to all present that the rapidly increasing weakness of the enamel borders as we approach the cervical line, calls, and calls loudly for an indestructible filling material that will spread under gentle pressure and make a perfect joint that will not change its form during years of service. Another requirement also is that the material must be of such nature that it can be put in place with the least possible expenditure of time consistent with perfect results.

For the sake of brevity we desire to direct your attention entirely to the filling of compound cavities as we find them in bicuspid and molar teeth, with the understanding that the grinding surfaces of these fillings are to be made of cohesive gold only. I do not need to describe the preparation of the cavities to you further than to say, the borders should be cut away till we have as strong and even walls as possible, with a very slight groove cut along the lingual and buccal walls and the base of the cavity, or in other words, the cervical wall should be made square as the case will permit, without making sharp angles, thereby giving the filling a firm foundation to rest upon. We should get the chief anchorage at or near the grinding surface, in most cases in the fissures.

It is absolutely necessary with this kind of filling to use some form of matrix, whatever kind best suits the operator. In my opinion the matrix should be so adjusted that it will give a little, so that the filling may overlap the borders slightly. Now we proceed to fill as our judgment may direct, first with amalgam filling one or two-thirds of the approximal portion of the cavity with whatever may be your favourite brand of amalgam, then laying on the crystalloid gold prepared for this purpose, till all the mercury disappears and we have the clean gold surface. When the remainder of the cavity is filled with cohesive gold, this makes a very good filling. Under these conditions, amalgam is seen to the best advantage. I have seen fillings of this combination doing excellent service for years, the amalgam shrinking much less, therefore, being far more reliable than when used alone.

If it is desired to use pure tin in the approximal portion of the cavity, we have the choice of two forms of tin, viz., tin foil and Robinson's Fibrous Filling Material. The latter being so far the superior to the former we take the liberty of passing the foil by without further notice.

With the Robinson material the mallet must be used and used very thoroughly, with it you can go to almost any extreme in contouring. It will spread somewhat under the plugger, soon turns dark but does not discolour the tooth substance, and if thoroughly condensed and properly finished will keep a tooth free from decay, under favourable circumstances, longer than any single metal used for that purpose, provided it be protected from friction, such as the grinding surfaces are exposed to. By way of experiment to test the strength of this material I have here to show you a very large crown restoration built up of Robinson's material and then a layer of gold foil tacked over the exterior surfaces giving it the appearance of a solid gold filling. I have similar fillings in the mouths of a few patients simply to see how they will stand wear and tear.

They have been in use now nearly ten years, and when last examined, about a year ago, they were practically as perfect as the day they were put in. The filling to which I have given the preference for several years is composed of equal parts of tin and gold for approximal surfaces and finished with heavy cohesive gold. The material is prepared by laying a sheet of Abbey's No. 4 non-cohesive gold foil on a sheet of No. 4 tin and folding once, with the tin on the outside ; then cut in strips from $\frac{1}{8}$ to $\frac{1}{4}$ inch in width ; then introducing the material by hand pressure, using rather coarse and sharp serrations, once in awhile bringing the mallets into use to make sure the filling is solid as possible. I have been told by dental friends that this sort of filling would disintegrate and finally wash out from under the gold, and I must confess that for a time I was quite uneasy about the large number of these fillings I had put in, but after several years of close observation I find if there is any disintegration it has been where the filling had not been made solid when put in. After the tin and gold has been in the tooth a short time a change begins to take place in the filling material. What it is I do not pretend to say, only that the material gets quite hard as hard as amalgam. It can be separated from the gold only by cutting. There is no change of form whatever that I have been able to discover. As to strength it is perfectly safe to restore any ordinary contour. I have here an extreme case to show you that was built entirely by hand pressure, using the mallet only on the grinding surface. For a long time I have used this material for filling cavities on grinding surfaces of molars and bicuspids for children, they do so well and show so little wear that I am tempted to use them for adults also.

I have tried many times to use non-cohesive gold in these approximal surfaces in this manner without achieving what I felt to be a success, the gold always showing a disposition to harden and get lumpy under pressure and scale in finishing. Recently my attention was called to the Wolrab pellets; have been giving them a pretty thorough trial for about a year and so far as I can see now they fill the bill admirably. It spreads under the instrument, either hand or mallet, and does not show that harsh and brittle form so characteristic of other gold. I do not think it will make as safe a contour as Robinson's material nor will it work quite so fast as other materials mentioned ; but where cavities are exposed to view and the preparations of tin are barred out on account of colour, you will find these pellets will make a quick and very reliable filling under a few layers of No. 60 cohesive foil. I have avoided some details that I consider to be of some importance for the reason that I expect to put in one of these fillings in your presence during this meeting.

THE USE OF ANTISEPTICS FOR STERILIZING CAVITIES BEFORE FILLING.

My purpose in this paper is to consider briefly the use of antiseptics in sterilizing carious dentine in deep seated cavities.

It is now regarded as good practice to leave in the bottom of cavities a layer of carious dentine if by its removal the pulp should become exposed. In such cases the continued health of the pulp depends upon the thorough sterilization of this layer. Upon this point Prof. Black says: "Where we cover in a little bit of softened dentine over a pulp nearly exposed, we may cover in the anærobic microbes. In a short time they may produce products that will destroy the pulp, or they pass through and penetrate into the pulp and infect. This action is brought about rapidly and the poisonous matter escaped towards the pulp. If we have covered these microbes in with the filling we have sealed up the elements for destroying that pulp. So here we need an antiseptic."

In considering this subject, naturally the first inquiry would be, what chemical or physical changes have taken place in this layer? Dental caries suggest decalcification. The degree to which decalcification has taken place depends upon which portion,—the superficial, the middle, or the deeper seated portion,—of softened dentine is under examination. Prof. Miller in his recent work gives the result of his investigations upon the whole map of softened dentine in the cavity, to ascertain the comparative loss of the organic and inorganic constituents. After giving his methods and the result of analysis, he says, "In plain words the carious dentine had suffered an almost complete decalcification—only one thirteenth of the original amount of lime salts being present. The organic matter had suffered the comparative small loss of two-fifths of its original amount. This loss is no doubt attributable for the most part to the direct action of micro-organisms upon the more completely decalcified portions of the carious dentine." Continuing he says, "The results of these experiments show that the organic matter yields last to the destroying agents." It will be seen, then, the layer of carious dentine which we propose to sterilize is, more or less, composed of the organic matter which has originally the basis substance of the dentine. Therefore it is albuminous, and if tested, should give an acid reaction.—(Miller)

In selecting an antiseptic for the purpose indicated, the length of time the antiseptic may be permitted to remain in the cavity before introducing the filling, should be considered. If only for a few minutes, or during the excavation of the cavity, the antiseptic should be one that will not coagulate albumen and one that is quickly diffusible. In some of the oily antiseptics we have some that meet these conditions, preferably the oil of cassia, oil of cloves, oil of turpentine, and eucalyptol. The diffusibility of these oils is conclusively shown by the experiments of Prof. Harlan. His conclusions are also fully borne out by clinical experience. In cases requiring immediate treatment, after thoroughly drying I usually apply oil of cassia and oil of cloves, equal parts. If the carious layer is of considerable thickness would apply oil of cassia alone. The latter being somewhat irritating, the addition of oil of cloves, will, in a degree, modify this action, if liable to come in contact with pulp tissue. Myrtol has been highly recommended by Pro. Harlan because of its being a very pleasant, non-irritating and highly potent antiseptic. Those who believe the antiseptic should be soluble in water, may use carbolic acid, bichloride of mercury, trichloride of iodine, and the addition to this class of agents, lysol, a perfectly soluble antiseptic of the cresol group. Of the above carbolic acid is most frequently used, and I have no doubt that in many cases if permitted to remain sealed in the cavity several hours, from 5 to 10, will effectually sterilize carious dentine. To overcome in part the coagulating properties of carbolic acid, I have been in the habit of using a mixture of carbolic acid one part, oil of cassia two parts, oil of cloves three parts. In cases when a permanent filling must follow treatment at the same sitting I find the above modification of Prof. Black's 1,2,2 mixture very satisfactory.

I have already referred to the need of dryness in the antiseptic treatment of this layer of carious dentine. This cannot be too strongly insisted upon. If the layer, especially the upper and more albuminous portion is saturated with the diffusion of any of the antiseptics, would be greatly retarded ; besides if an antiseptic, ready soluble is used, its effective strength may be reduced to a degree which renders it inert. In the layer nearest the pulp, where we may suppose caries is still active, the normal tubular structure of dentine is more nearly maintained. These minute tubes are a physical barrier to the diffusion of an antiseptic, whether in solution, an oil, or an emulsion. And if the moisture which is natural to the protoplasmic contents of the tubules, or to the microorganisms in them is not removed in greater part, the diffusion of the antiseptic is still interfered with. How may we first obtain this dryness? By bathing the layer with an agent which has an affinity for water, as alcohol, and evaporating it with warmed or heated air.

The methods practised to obtain sensitive dentine by dehydration are usually efficient, and if carefully carried out, by time the cavity is prepared, we will have desiccated the layer of carious dentine in the bottom. The use of alcohol for this purpose may be objected to because of its coagulating effects upon albumen. This property, however, would be very slightly exhibited, because of the rapidity with which it would be evaporated by the hot air blast.

It may be in order in this connection to refer to a class of cases in which caries recurs after the tooth is filled, because of defect in a portion of the margin. The caries advances along the wall of the cavity softening a portion of dentine under the filling, often, because of the difficulty in reaching this diseased portion, the filling is removed and the whole operation done over. This may in some instances be avoided provided the portion of carious dentine beyond the reach of the excavator can be sterilized. To effect this the whole of the softened dentine must be thoroughly dried, the antiseptic applied and the opening carefully sealed for a day or two, after which permanent repairs of the filling may be made.

The imperfect removal of carious dentine suggest careless methods of practice, and yet, if partially decalcified dentine on the walls of the cavity well away from the margin, may be made fixed matter by antiseptic treatment. Why may it not be left and thereby save time and avoid the infliction of pain upon the patient?

The difficulties in sterilizion increase in proportion with the increase in thickness or mass of softened dentine we are called upon to treat, and with our present imperfect knowledge of antiseptic agents on, perhaps I should say careless methods in their application, the use of these medicaments should be restricted except in rare instances to the sterilization of the layer of softened dentine left in cavities for pulp protection.

A METHOD OF TAKING IMPRESSIONS FOR ARTIFICIAL DENTURES.

By R. S. Rathbun.

Select an ordinary impression cup, in size adapted to the case in hand ; then warm over a spirit flame or Bunsen gas jet, enough beeswax to secure the impression ; carry it carefully and firmly to place in the mouth, strictly noting that the wax is pressed closely to all parts to be involved in the impression, for neglect here often incurs failure further on ; remove, trim off excess and with fingers enlarge slightly that part involving the alveolar ridge, raise heel of impression a trifle, then with wax spatula, warm, cut a few grooves to better secure adhesion of plaster thereto. When thus armed with a perfect impression cup, mix a sufficient quantity of fine plaster to the consistency of thick cream, largely fill cup as before prepared, then carry it to place in the mouth ; in full upper impressions carry heel of cup as much in advance as the case will permit, thereby forcing excess up under cheek and lip and outward, which will prevent plaster from running back in the mouth and causing strangulation, etc.; for partial impressions use same method, observing to cut groove in wax between teeth to secure plaster, but be sure not to change wax at neck wall of natural teeth as you thereby largely avoid breaking the plaster impression thereat, on removal from the mouth. The advantages of this method seem pertinent to me without further comment. The advantages attained by its use over other materials and methods are worthy a trial. To the student or young practitioner or even the older one who as yet never deemed it worthy a trial let me suggest, try it, and you will bring to your patients who are afflicted by wearing false teeth, that health and satisfaction hitherto not experienced.

Dental Review.

British Journal of Dental Science.

LONDON, JANUARY 15th, 1892.

CLEANLINESS AND VULCANITE.

In these days when the teachings of Sir Joseph Lister, and of the many who have followed in his footsteps, have brought home to all the importance of cleanliness, it is sufficient to call a thing dirty, to at once bring it into disrepute. We purposely here use the broad term cleanliness—all understand what that means, none are so bold as to dispute its propriety, however loose they may be in following its precepts. There are, no doubt, degrees of cleanliness. To the ignorant, it does not mean the same thing as to those more conversant with the mysteries of contagion and infection. The use of antiseptics may, perhaps, in some cases be omitted, in dealing with the animal body, without any injurious result following. We know that a healthy body is its own antiseptic. Its cells and juices are inimical to the life of the organisms which are the *fons et origo* of contagion and infection. But we also know that its power in this direction is limited, if the dose of the poison be too great then it is not rendered inoccuous, it produces an effect on the body; it produces disease. It may seem unscientific, but it is, we fancy, somewhere near the truth, when we say that if in all every day matters, cleanliness, as it is understood by any reasonable man, be followed, there will be little risks of the above mentioned dose being exceeded. True it is that antiseptic drugs render the attainment of this cleanliness a more easy matter, but ordinary household ways are in most cases sufficient for every-day purposes. These remarks apply to artificial dentures. Cleanliness with these are absolutely essential. Essential first, for the health of the wearer, second, for the comfort. The comfort is surely self-evident, a view, we are thankful to say, most patients take, though some, alas! do their best to upset all our preconceived ideas on this subject. On the ground of health, however, there is room for the dentist to urge any of his more lax patients to redouble their efforts. The use of a dirty denture cannot help but be injurious to the mucous membrane on which it rests, and certainly must form the nidus for the development of many poisonous matters which later find their way into the alimentary tract. Cleanliness is, therefore, essential and is, moreover, easily attainable by the simple method of scrubbing well with a tooth-brush rubbed on soap and by allowing the denture to remain in water over night. We cannot too much insist on the need of impressing on patients the fact that dentures should *not* be worn at night. First, on the ground of cleanliness. Second, to allow the mucous surfaces a period of rest wherein to recover their natural tone. We give it as our opinion, that if these details are carefully carried out, the cases in which irritation will follow the use of rubber plates, will be very very few. True they do occur, but how infrequently when we consider the number of plates that are worn. Vulcanite may not have been an unmixed blessing. It may have been the means of introducing a great laxity, not to use a stronger word, in dealing with preparation of the mouth, covering over, as it were, a multitude of sins. It has, undoubtedly, been one of the chief causes in the deterioration of mechanical skill as applied to artificial dentures. But it has been the means of bringing within the use of many an aid to digestion, and therefore of health, without which otherwise they must have been. An annotation has recently appeared in the *Lancet*, which is rather liable to cast some slur on the use of this substance. We reprint it on another page. But here we would remark that surely the word "prevalent," conveys an altogether inaccurate impression regarding the frequency of "rubber sore-mouth." We all know it does occur, but very infrequently, if ordinary cleanliness is observed, we believe, most who have had experience will agree. It is well, therefore, to lay stress on this infrequency, for circulating so largely, as does the *Lancet* amongst medical men, it would be a pity if they should form a false opinion on the adaptibility of vulcanite to dental purposes, and still worse if they impressed this opinion upon their patients.

We notice, and are glad to do so, that a dentist, Mr. Frank Strickland, holds a seat on the newly elected Medical Council for the Cape of Good Hope. He was nominated by the Cape Government.

Some interesting remarks before the Societe de Chirurgie of Paris, on the subject of Cocaine are reported in the *Lancet* and may well bear brief repetition. M. Quenu's experience of the drug is limited to sixty operations, the strength of the solution employed being one fiftieth, and the maximum quantity of cocaine injected in each instance being 7 centigrammes. In three subjects disquieting symptoms manifested themselves; in one (radical cure of hydrocele) these symptoms were formication of the extremeties, pains, anæsthesia, and finally cerebral excitement. This surgeon now never exceeds 10 centigrammes as a dose. M. Schwartz's experience extends to 300 operations, in which the drug was employed without accident. Once, however, after the injection of a solution into the tunica vaginalis, a *commencement d'accident* occurred which was promptly obviated by the incision of the serous sac. Following Kummer (experiments on the lower animals), he ascribes great importance to the influence of Esmarch's bandage on the tolerance, in given cases, of the drug, the compression, by retarding diffusion, allowing of larger doses being exhibited. In operations on the limbs his maximum dose is 7 centigrammes; for the tunica vaginalis 10 centigrammes, and for the face and trunk 5 centigrammes. M. Regnier has witnessed two cocaine accidents (dose 1 centigramme) in his surgical practice, both patients being "cardiacs." In one, symptoms of cardiac failure (asystole) developed, and the individual died a month later. M. Moty has employed cocaine in dental practice between 5000 and 6000 times, and only on two occasions, and that quite recently has he experienced any *contretemps*. He opines that the concentration of the solution has much to do with the danger incurred. M. Reclus shares this opinion, and is persuaded that a 1 per cent. solution is strong enough for all purposes. He has utilised cocaine in over 1000 operations without encountering more than a few *alertes*. With injections of from ten to twelve centigrammes he has frequently performed painlessly such operations as gastrotomy, castration, incision in appendicitis, &c. Care must be taken that the solution be not introduced into a bloodvessel, and the surgeon must be on his guard whenever cocaine is brought in contact with a serous surface.

It is hardly likely that any dental surgeon would be so grossly careless as to leave arsenic about when it was likely to be meddled with by those unacquainted with its poisonous properties. Nevertheless, the following incident will serve to call to mind the great carefulness which should be exercised in these matters.

The wife, six children and the servant of Mr. George Monk, saddler and tripe dresser, of Blackburn, have been poisoned by partaking of dumplings with which arsenic had accidentally been mixed. The servant died, but the others are recovering. The puddings were made by one of the daughters. As the paste of two of them was too thin, she thickened it with what she believed to be flour from a caster, but which was really arsenic which had been used on the sore leg of a horse. The canister was labelled poison when Mr. Monk used it, and it was put on an upper shelf in the kitchen. The servant had torn the label off, believing that the tin contained flour, and put the canister on the lower shelf. The servant ate heartily of the dumplings, the others only sparingly, as they found something wrong with the taste.

It seems that, should the supply of cocaine from the American shrub Erythroxylon coca fall short, we shall be able to obtain some from India, the shrub having been cultivated for many years in the Madras Presidency. There seems, however, to be some doubt as to the uniformity in the standard of the Indian grown coca.

It is interesting to notice that an old member of our profession, Mr. James Orrock, is one of the most earnest promotors of the "National Gallery of British Art." Mr. Orrock practiced in Nottingham for some years, but abandoned it at a comparatively early age, and devoted himself to art, in which he had always evinced great interest.

In a recent issue we gave a summary of Mr. Hutchinson's views on the excision of the tongue by the wire ecaseur. Now Mr. Roger Williams, late surgical registrar of Middlesex Hospital, sends to the British Medical a list of cases which tell a different tale as regards the mortality following the operation. Mr. Hutchinson believes he has lost only one patient. Mr. Williams records a mortality of five out of twelve. It is a pity Mr. Hutchison has no time to collect statistics regarding his cases, for if the prevalent use of scissors and knife is to be given up a definite statement is very desirable.

DEATH has been active amongst the ranks of the Medical Profession during the last few weeks. First, Sir Risdon Bennett, then Mr. John Wood, and now Mr. Beckley Hill have been taken. Mr. John Wood occupied a seat on the Board of Dental Surgery at the Royal College of Surgeons for many years, and is remembered by many dental men.

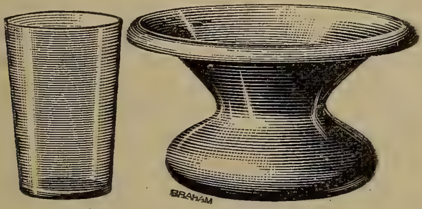
It may be of interest and importance to some of our readers to know that life insurance premiums can, and should be deducted from the assessment of income for tax purposes Moreover, if this has not been allowed, the tax thereon can be claimed at any time within three years following the expiration of the year of assessment.

THERE is room, apparently, for a few dentists at Kula (India). A correspondent of a daily paper, says that the surgeon-dentists there, are the village blacksmiths, and their forceps are tongs two feet long. The difficulty with these instruments is two fold, firstly to get them into the sufferer's mouth, and, secondly, to get them out again.

In Stockholm, there is a Scholarship for female dentists instituted for the purpose of rendering assistance to women without means, who intend to study dentistry. It is known as the Free Wilhilmina Hierta's Scholarship and has just been given to Fröken Elena Levin, who has qualified at the Gothenburg College for dentistry. The use of such scholarships is very great, especially when some stipulation enforcing some original work. It is a matter for regret that our schools at home are so poorly off in this respect.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.



Mr. Rutterford has introduced a hand spittoon that will fill a long felt want. It is of deep blue glass, with a tumbler to match—a colour that perhaps best disguises the offensive show of blood—but its essential feature is its shape; the total depth is but a few inches, reservoir included, the result being that the margin can be placed right under the chin, a position quite precluded by the usual deep reservoir, on account of its coming in contact with the patient's chest. This facility for catching all outflowings, especially in operating under anæsthetics, will be appreciated by all who see this exceedingly simple and convenient hand spittoon for the difficulty in preventing an unfortunate accident when the patient is in a semi-unconscious state, just coming round, must have been felt by all. To send a patient home with a new frock spoilt is not a happy wind up. The illustration gives a very fair idea of the shape of this spittoon.

Selection.

THE CROONIAN LECTURES.

On the Progress of Discovery Relating to the Origin and Nature of Infectious Diseases.

Delivered at the Royal College of Physicians, London.

By J. BURDON-SANDERSON, M.D., Ed., F.R.S., &c.,
Professor of Physiology in the University of Oxford.

THE ETIOLOGY OF INFLAMMATION.

Concluded from page 34.

So much for direct observation. I think we must admit that it is possible for live bacilli to be incorporated. Let me now describe to you Metchnikoff's method for comparing the process of incorporation in a susceptible animal with that observed when susceptibility has been annulled or diminished by previous infection. In the next lecture I hope to discuss the various methods by which the state of insusceptibility can be acquired, in their bearing on the etiology of specific infections ; for the present we will assume that these methods exist, and can be relied on. Among these diseases is the well-known disease of pigs known as rouget, insusceptibility to which is acquired by inoculation with mitigated cultivations, in the same way as in the case of anthrax. Rabbits, of which the "immunity," as it is called, had been tested by inoculation with virulent material, and found to be infection proof, were used by Metchnikoff for the purpose of comparison with normal rabbits, as regards the behaviour of their leucocytes. The method used consisted in introducing under the skin a contrivance familiar to all pathological students as a Ziegler's chamber,* but differing from it in being made up of four cover-glasses arranged in pile and cemented together at their edges, so as to leave the intervening spaces accessible. If this system of plates had been dipped in a virulent culture of rouget, the spaces between the cover-slips are found, when removed for examination two hours and a half after insertion, to be crowded with leucocytes, in which a very considerable number of bacilli are incorporated, whether the rabbit has been protected by inoculation or not. But subsequently, says Metchnikoff, the difference between the behaviour of the leucocytes in the two cases becomes more and more marked; so that, for example, two days after insertion, the leucocytes in the trap taken from the unprotected rabbit are all in a state of degeneration. He admits that there were also degenerated bacilli which were not incorporated, but thinks that these had probably escaped from leucocytes destroyed in preparation. Similarly, Metchnikoff finds that in animals naturally insusceptible, the immunity is due to the endowments of their leucocytes. Thus, in the white rat, to which anthrax can be communicated with great difficulty, the introduction of active virus gives rise to a local inflammatory reaction, whereas in other rats it fails to do so. On "phagocytic" principles, inflammatory reaction is prophylactic. It is the colourless corpuscles of the blood, therefore, which, by virtue of the part they take in ordinary inflammatory reaction, from the first line of defence against the invasion of microbes. If this is broken through, a second line admitted by Metchnikoff to be in general an ineffectual one—is constituted by the tissue cells of the liver and spleen.

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* Ibid., vol. iii., p. 289.

Such are some of the most important and convincing proofs which Metchnikoff offers in support of his theory. As the theory itself has been received, on the whole, with little favour by pathologists, it is more necessary to refer to the arguments of the few writers who have given it a more or less qualified assent. In my last lecture I refer to the work done by one professed adherent of the doctrine of phagocytosis, Dr. Hess.* But Hess scarcely went more than half way with Metchnikoff. He anticipated him in the use of glass chambers introduced under the skin as a means of comparing the local reaction which is occasioned by the introduction of bacillus anthracis in a susceptible animal, such as the rabbit, with that which is to be observed in an insusceptible (the dog). He found that whereas there was scarcely suppurative reaction in the rabbit, the virulent material which had been introduced was invested by a zone of leucocytes, in which many bacilli were incorporated. As these were surrounded by an outer zone of leucocytes free from bacilli, the focus of infection was secluded

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† See M. Bouchard's Address at the Berlin Congress, in vol. i., p, 49, of the "Verhandlungen."

and effectually protected from the influence of the surrounding tissue. Again, when he observed that the bacilli of splenic fever introduced into the circulating blood of the frog were incorporated by the colourless corpuscles, that after several days they disappeared, and were then to be found in the spleen, the advantage or use of this incorporation seemed to be little more than mechanical.

In France, one of the strongest and most influential supporters of the doctrine of phogocytosis is Prof. Bouchard ;* but he, like Hess, is eclectic, and chiefly emphasizes the fact that the existence of inflammatory reaction—*i.e.* exudation and emigration of leucocytes at the seat of infection—is a condition unfavourable to its spread. In the very admirable exposition of the subject which he gave in the general sitting of the Berlin Congress, he took the process of inflammation as his point of departure, defining it, in accordance with the definition which I submitted to you ten years ago, as the reaction of living tissues to injury, that reaction consisting in the accumulation of mesodermic cells, "*qui affluent verse le foyer du mal et le circonscrivent*," and further on he designates this as a "pathological act provoked by a local irritation of the part." Admitting, as Hess does, that virulent microphytes, when introduced into the circulating blood of *non*-susceptible animals, are incorporated by the colourless corpuscles, M. Bouchard agrees with Metchnikoff in thinking that they may be devitalised or attenuated ; but this he attributes, not to the mechanical action of incorporation, but to an "*état microbicide*" or "*bactericide*" which they participate with the fluids and solids of the living body. As to what is meant here by the bactericidal state and how it is brought about, Bouchard has made observations of great importance to which we shall have to recur later. For the moment it is sufficient to indicate that to him, although he is regarded as a champion of Metchnikoffism, the function of leucocytes is merely mechanical ; the dissemination of contagious particles is prevented partly by the crowding round them of leucocytes in great numbers, partly by incorporation, but not by virtue of any power of digestion or by any chemical action whatever which is peculiar to amœboid cells. I have referred to Hess and Bouchard, not as opponents, but as supporters of the doctrine of phagocytosis, and we have seen that that support is a very partial and qualified one. I am, indeed, unable to find that any pathologist of repute accepts what, I think, *must* be regarded as M. Metchnikoff's fundamental propositions—namely, (1) that the devitalisation of microphytes is a special and exclusive privilege of phagocytes—understanding by the term both leucocytes and certain connective or epitheloid cells in which incorporation is observed to take place ; and (2) that leucocytes are capable of *discriminating* between contagious particles of different kinds, and that they exercise this power of choice *for the good of the organism* of which they form part. The rejection of the first proposition rests on the concurrent testimony of the best pathological histologists, to the effect that all pathogenous microphytes degenerate somehow—*i.e.*, show signs of structural disintegration—if they remain a sufficient time in relation with living protoplasm, and that this degeneration takes place both in blood or lymph and in tissue ; and that, when leucocytes are present, it constantly happens that the unincorporated microphytes show the same signs of disintegration as those which are imprisoned and in the same degree. It further rests on the observation that in general vigorous microphytes—that is, those which are in full vigour—are not incorporated, so that incorporation comes to be in itself a sign not of actual death, but of impaired vitality and diminished virulence. Now both of these are points which can only be decided by direct microscopical observations of an extremely difficult and delicate kind. The best are those which were carried out a year or two ago at Gottingen and Breslau by Dr. Nuttall and Dr. Bitter, under the direction of Professor Flugge.* Dr. Bitter observed the process of rapid degeneration of the bacillus anthracis which occurs in "protected" sheep—that is, in animals vaccinated on the large scale, as a protection against splenic fever, by Pasteur's method. Bacilli introduced subcutaneously in properly protected sheep are made short work with by the tissues. There are plenty of leucocytes present. Or, putting it otherwise, the injection gave rise to a localised inflammation. There are also plenty of bacilli, some of which are incorporated, others not, but all degenerate and eventually die. An observation like this, which can be repeated over and over again, is in some respects more convincing than an experiment made in strict accordance with the experimental method in which the conditions of the natural process are imitated, with the exception or exclusion of the one which is in question—the presence of phagocytes. It is, however, desirable to employ both methods—that is, to bring the question at issue within as narrow limits as possible. If, as the observation in gross indicates, microphytes are devitalised not only in cells, but in the liquid in which they float, it should be possible to verify this by observing the process in liquids of the same kind which contain no cells. Dr. Nuttall has carried this out most thoroughly by subjecting a variety of non-corpuscular animal liquids, such as humor aqueus, pericardial fluid, serum of blood, with which bacilli were mixed, to microscopical examination in the perfectly fresh state and under normal conditions. As regards temperature, this was effected by placing not merely the object, but the whole microscope, in a chamber of which the temperature was constant to a fraction of a degree (1). The liquid to be experimented on was first placed on the surface of a cover-glass, and then inoculated in the usual way with a platinum loop charged with virulent bacilli. It was then cemented, drop downwards, on to a slide provided with a " well on its upper surface, so that the cover-glass formed the roof of a closed chamber into which the drop hung. When a drop of blood obtained directly from the circulation is treated in the way I have described, it of course coagulates rapidly, and very soon the disc-shaped coagulum is surrounded by a zone of serum. If the impregnated platinum wire is brought into contact with this zone, so as to introduce a certain number of bacilli, the process of disintegration can be watched. In human blood and in the blood of the insusceptible dog, it is extremely rapid, being accomplished in an hour. In that of the susceptible rabbit it requires five hours. If in a similar experiment salt solution is substituted for blood, the introduced bacilli remain unchanged; if bouillon takes the place of the blood, they at once begin to multiply, so that at the end of the hour the drop is crowded with long filaments. The second of these check experiments might suggest that the bacilli die for want of available nutriment, but the preceding one shows that the influence of fresh serum on microphytes is toxic, not atrophic.

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* Dr. C. Hess· Untersuchungen zur Phagocytenlehre. (Virch. Arch., vol. cix., p. 365.)

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* Flugge: Studien ueber die Abschwachung Virulunter Bacterien· (Zeitsch. f. Hygiene, vol. iv., p. 208.)

Another form of experiment devised by Dr. Nuttall is equally conclusive, and the more striking that it is so simple.

Lymph can be easily obtained from the frog by introducing a small fragment of sterilised cotton-wool under the skin. It soon becomes soaked with lymphatic fluid, which can be sucked out of it with the aid of a fine capillary tube and transferred to the cell, inoculated with anthrax culture and observed as a hanging drop. The value and interest of this experiment consist in the opportunity it affords of observing incorporated and unincorporated bacilli side by side; for frog lymph, collected in the way I have mentioned, contains leucocytes which, at a temperature of 18° or 20°, display amœboid movements, but not in sufficient numbers to interfere with observation. The result of the observation is that all bacilli, whether enclosed or free, undergo the same sort of change. They first become granular, and then so pale that they can scarcely be made out without staining.

I must now ask your attention to another point investigated by Dr. Nutall—that, namely, of the inverse relation between *intensity* of *local reaction* and *liability* to *constitutional infection*. We have already seen that if you introduce a clean bit of capillary tube under the skin, it remains quiescent, and that this simple experiment affords the basis of a very exact method of testing the pyogenic properties of chemical irritants. If the tube is charged with a culture capable of producing local reaction, its presence is sooner or later resented in the same way as it would be if it contained croton or mercury. Under these circumstances the degree and character of the effect affords a convenient and very reliable criterion of the existence of such a relation between the contents of the tube and the tissues of the animal experimented on, that the contact of the one with the other produces inflammatory reaction. Now, what the experiment shows is that in the same animal in which a mitigated virus festers, but produces no ulterior consequences, an unmitigated one produces no observable reaction, but eventually kills the subject of experiment. Metchnikoff's explanation is the teleological one—one which you have had so often before you—that it is for the good of the organism. But if the purpose of festering is, as he maintains, defensive, why does it happen when there is no danger, and fail when to fail is fatal? It is, I think, much more probable that local reaction and liability to infection are linked together, not by causal relations to each other, but as products of the same antecedent conditions—i.e., that the reason why a virus of great intensity does not produce suppuration is *that it is intense*; in other words that the same agent which in smaller concentrations excites exudation and emigration paralyses these processes when in greater intensity. If it is true that a physiological link such as I have indicated exists between the tendency to local reaction and proneness to infection, we should expect that any cause or agent capable of paralysing local reaction—that is, of exhibiting the inflammatory process—would so long as it operated, aggravate the intensity and promote the spread in the effected organism of a contagium. Guided by considerations which, although otherwise expressed, are in substance the same as those which I have now submitted to you, M. Bouchard and his able collaborateurs in Paris have thrown much light on this difficult subject. The purpose of their investigations has been, first, to ascertain whether agents of the kind suggested exist, and, secondly, whether they possess the aggravating power assigned to them—using the word "aggravating" as opposed to "attenuating"—whether, in short, under their influence a *mitigated* virus acts as if it were *virulent*, or the immunity of an individual is diminished or annulled. Do agents exist by which inflammatory action can be arrested at will? To obtain an answer to this question we must go back with M. Bouchard to the starting-point of their inquiry. Among the most interesting of the specific pathogenic microphytes which have been worked out during the last few years is the bacillus pyocyaneus, the bacillus of blue pus. This organism is in the first place remarkable as the source of the colour from which it derives its name, which it communicates readily to any of the cultivating media in which it grows, and yields to chloroform. It is no less remarkable for the definite character of the symptoms which it produces when injected into the circulating blood of a living animal. A few drops of the pure cultivation produce pyrexia, followed by collapse, purging, and death, with, as is seen on dissection, intense enteritis. In addition to this, all that is necessary for us to have before us just now is that the blue-pus bacillus is not only virulent but toxic—that is, that although introduced in minimal quantity into a vein, it kills by multiplication in the organism, after the manner of a contagium, *almost all the symptoms of its action can be produced by the injection of the products of* *its vegetation outside of the body—i.e., of a sterilized culture.* Now it is this product which M. Charrin found in 1888 to possess the required power of inhibiting the inflammatory process. In the rabbit, as we have seen, cultures of this microphyte, when injected *intra venas,* produce rapid death, preceded by fever and collapse. If it is injected subcutaneously, it does the same thing, producing no local symptoms. In the guinea-pig, which is much less susceptible, it produces local inflammation at the seat of puncture, but no signs of general infection; but, says M. Charrin, if the insusceptible guinea pig is "prepared" by infusion of some of the product of the very same bacillus, it is thereby, so to speak converted into a rabbit for the nonce—local reaction disappears, constitutional infection takes its place.

What is the meaning of all this? What M. Bouchard says about it is, that the action relates to the inflammatory process as a whole—that is, that it is not a paralysis of amœboid cells, as has been supposed, but an action on the whole machinery of living tissue, on vaso-motor nerves as well as bloodvessels; and accordingly he places the chemical action of microphytic products with the action of such general depressants as cold, exhaustion, or even mere restraint of bodily movement, each of which has been shown to favour infection by diminishing local reaction. For by experiments which appear to me to be of surpassing interest he shows that the same culture which, when introduced under the skin of the relatively insusceptible animal in a Cohnheim's tube, produced general infection without local reaction if the animal were immobilised, produced local reaction—i.e., suppuration without infection—if it were left at liberty. What explanation can be given of all this but one--namely, that in each instance the same cause which weakens local reaction weakens at the same time, and in a similar degree, the power which the organism as a whole possesses of defending itself against infection. In what this power of defence consists I will endeavour to set forth in the next lecture, in so far as present knowledge is adequate. In the meantime let us avoid any other meaning to the unquestionable fact of phagocytosis, excepting first that the emigration of leucocytes is an essential part in the process of inflammation, and that there is an antagonism between this process and the process of general infection. The most important fact that we have learnt to-day is that the living tissues and fluids of the human and animal body possess in a greater or less degree the power of arresting the development of certain disease producing microphytes, and that certain chemical products of microphytic vegetation impair this protective power, and at the same time inhibit local inflammatory reaction.

In my next lecture our inquiry will extend from the consideration of the non-specific noxæ, of which the morbific action chiefly manifests itself in the production of inflammation and fever, to the more interesting, but also much more difficult question—How does the organism protect itself against specific infections?

Abstracts of British & Foreign Journals.

CLEFT PALATE.

By Dr. Norman Kingsley.

Some sounds in the English language must go entirely through the mouth: other sounds must pass entirely through the nasal cavity, and still other sounds must pass both ways. Perfect speech involves these three things—a passage that can be shut off in such a way, by a valve working between the two passages, that at times the sound is directed one way, and other times both ways, and with organs of that character any one can speak the English language, or any other language, as it is spoken, correctly and perfectly. But the moment you split that valve, or open a hole through it, or render it in any way imperfect, you immediately destroy the ability to perfectly articulate speech. Now the point to consider was, how could we restore the absent velum, restore that gap, and give to it the function of a whole velum? The result of all that thought was the making of an instrument.

I had an interesting experience in London. I made some instruments for some patients there, hospital cases, and they immediately showed an improvement in speech. But with all my claims as to the necessity for any interference in these cases, the necessity involving that a velum should be made which should act as I described, with all I had said on this subject before medical societies and dental societies in London, and such men as the late Sir Wm. Ferguson, who had an enormous reputation for operating on cleft palate, it did not do a bit of good. They said it was well enough in its way, but it would never amount to anything.

I took one of my best patients to Sir Wm. Ferguson one day—a lad of eight years—and he looked down at the boy in his lofty way, and looking into his mouth, said, "That is very well, my lad, but when that fails you, come to me and I will sew you up." Mr. Pollock took me one day into the wards of St. George's Hospital, and showed me his operation. It was one of the finest surgical operations I ever saw; beautiful union throughout the entire cleft, even down to the very tips of the bifurcated uvula. I asked him how long the operation had been performed, and he told me twelve months. I asked, "How does he speak?" He said, "I do not know." I had a newspaper in my pocket, and I handed it to the patient, who was about thirty years of age. He started to read. It was absolutely unintelligible. So far as the object sought was concerned, the operation was absolutely valueless; it did not do the man one particle of good. The reason was, as Dr. Ottolengui stated, because that beautiful union had been attained at the expense of the length of the palate, leaving a great hole behind it which could not be closed. I have seen a few operations, possibly one-half of one per cent. of cleft-palate where I could feel the surgeon was justified in operating after the patients had reached twelve years of age. But with all I can reasonably claim as the result of what has been done with instruments, I am looking forward and hoping for the time to come when surgeons will have boldness enough and skill enough to take the average cleft-palate infant and sew up the gap and get good union and make it totally unnecessary for the patient, in after life, to have to resort to appliances. I believe it can be done in the majority of cleft-palate cases, provided it is done as early as you would sew up a hare-lip. If you can get union at that age, and then if it is impressed on the parents and friends that the child must be taught to talk, with the natural growth of the child and the teaching, the palate will develope, and I believe hey will learn to speak as normally as you or I can.

Brooklyn Medical Journal.

EROSION.

By G. EDMUND WELLS, D.D.S.

GIVEN, all the teeth, bathed alike in an acid fluid and erosion appearing upon limited parts of certain teeth only, is it not reasonable to assume that the portions attacked are inherently more susceptible to its solvent action than the parts that escape? Such a conclusion I have reached, and it has been substantiated by operations upon such teeth themselves. In their preparation for filling, the variation from normal structure can be plainly perceived. Such a tooth seems to have lost its integrity or tone, and cuts almost like horn. This alteration in tooth structure is certainly not to be accounted remarkable, as we are aware that the teeth are subject to numerous pathological changes, as are any other organs in the body.

By actual demonstration I have been convinced first, that, where erosion of the buccal or labial surfaces of the teeth occurs, careful test will prove the secretion of an acid mucus by disordered glands situated in the mucous membrane that lies normally in contact with them, although the reaction of the saliva as a whole is distinctly alkaline; and second, where erosion occurs upon the surfaces of the teeth which are not normally in contact with the mucous tissues, the reaction of the saliva as a whole is constantly or at times of an acid nature.

From these demonstrations it has been concluded that erosion is caused by, first, the dissolution of the tooth-structure by an acid agent which at times is secreted by disordered glands in direct juxtaposition, and whose destructive action is limited by surrounding alkaline fluids; and second, the dissolution of the tooth-structure by an acid agent held in solution in the saliva, which is not sufficiently powerful to attack normal enamel, but seeks out and destroys any surfaces which through inherent defects are weak enough to yield to its influence.

I would classify the treatment as follows:

First, where the disease is limited to a very few anterior teeth, and exhibited upon their buccal and labial surfaces only, it may be taken for granted that the disease is in its incipiency, and but few glands have become disordered. It being possible to discover them by their abnormal or engorged appearance, would it not be practicable to entirely destroy and eradicate them, and so having eliminated the source of the disease stop further progress and extension?

When a dermatologist punctures a hair-follicle with an electric needle, and by the aid of the galvanic current "electrocutes" it, thus ending it functional life, I can see no reason why we should not bring the same methods to our aid, and thereby exterminate these little erring glands; and secondly, where the erosion is caused by distinct acidity of the saliva, efforts should be made by constitutional treatment to overcome this diseased condition and restore it to its normal state.

Under all conditions lime-water should be used as a mouth wash, frequently and in quantities. I would here note that I prescribe prepared chalk to be packed around the necks of the teeth at night, and morning after breakfast, when possible, and also between teeth containing large approximal fillings, but with the object of preventing caries more than erosion.

Cosmos.

ACID ON THE TEETH.

By Dr. G. W. Weld.

A patient, whom I had not seen for five years, returned to have his teeth examined. His teeth were but little decayed, and the fillings, both gold and amalgam, appeared to be in good condition; but his front teeth, especially the cuspids and bicuspids, near their cervico-labial portions, were very extensively grooved. In short, it was a typical case of erosion.

Now, this gentleman, about four years ago, was connected in business with the Pennsylvania Railroad Company, and was called on at one time to supervise the shipping of a carload of tooth-wash and powder to some western city; and the manufacturer made him a present of some of the wash and powder; and from time to time kept him well supplied. As the wash was very agreeable to the taste and cost nothing, he very naturally used it freely. When he had been informed of the nature of his trouble, he, naturally inquired the cause. I told him that the etiology of the trouble was somewhat obscure, but that it was supposed to be due to an acid acting upon the substance of the teeth from without. He then informed me of the wash which he had been using. Examination proved the *powder* was alkaline in reaction, and of course perfectly harmless; but the liquid proved to be acid in reaction, and I believe the erosion of the teeth was caused entirely by the generous use he had made of that wash. It has, as I observed, a pleasant and agreeable taste, being flavoured with anise and cloves. I believe great injury is often done to the teeth by the injection of some one of the many proprietary medicines with which the market is so abundantly supplied. It seems rational to believe that the etiology of erosion is, first, the presence of an acid at the cervico-labial surface, that acid being introduced from without, and retained at the margin of the gums, and that this acid first attacks the thin and weak surface of the enamel, and then the dentine. Lactic acid acts on the enamel more readily than the other weak acids, excepting of course, hydrochloric acid.

International.

COUNTER IRRITANTS.

By A. W. Harlan, M.D., D.D.S.

In a peridental inflammation from too early filling of the root or changes which this membrane undergoes from an acute attack of the so-called Rigg's disease prompt relief is called for. Scarification or leeching will not furnish this and counter irritation is called for. This may be accomplished by the use of a heated steel disc, a disc about the size of a nickel, dipped in boiling water and applied to the surface of the gum for less than half a minute will generally relieve these cases. In the first stage of peridental inflammation due to pyorrhœa alveolaris we may relieve by using the following refrigerant:

R	Plumbi acetatis	ʒss.
	Tinct. opii, ...	℥ss.
	Water	℥vi.
M		

This is to be applied with cotton. The gum should be dried and a mat of sufficient size wet with the fluid is placed upon it and allowed to remain for half an hour. When a blister is quickly needed, stronger ammonia may be used as follows: A pellet of cotton the size of a pea, or a little larger is wet with the ammonia, placed on the gum and a copper or lead disk placed over it to keep the ammonia in contact with the gum. Allow it to remain one-half minute, then remove and in a few moments the blister may be punctured. Wine of opium may be used to counteract this pain if it proves too severe. Absolute alcohol and chloroform or ether may be used in the same manner. The tincture of cantharides can also be limited in this way, or cantharidal collodion, croton oil or oil of mustard. The generally used revulsive compound of equal parts of tincture iodine, aconite and chloroform is not a true counter irritant although the general effect is likened to that of counter irritation.

In this combination it is true that the corneous layer is lifted by the serous exudate which is limited by the rapid absorption of the aconite and iodine, while the chloroform is the true vesicant. The general practice of counter irritation and the theory, is based on the idea that irritation or inflammation shall terminate in resolution which cannot be if more than an infinitesimal quantity of pus be present. After the formation of pus common sense and a proper regard for the welfare of the patient means that evacuation, not counter irritation should be the practice. Much of the object of true counter irritation is lost by improper application and combinations of easily absorbed medicines which should always be the adjunct instead of the concomitant medication. After the production of the blister anodynes are to be used as tinct. benzoin comp. cocaine in liquid vaseline, iodoform bituminized and worked up in lanolin—the aforementioned lead water and opium or black drop—vinum opii, cannabis indica, belladonna ointment made with lanolin, chloral-camphor in lanolin. The injection of chloroform, two to four minims.

The local application of tinct. gelsemium or veratrine—a continuous stream of hot water or the application of mucilaginous protectives or the painting with flexile collodion.

Dental Review.

ARTIFICIAL TEETH FROM A HYGIENIC POINT OF VIEW.

It is common experience amongst dentists that a very large majority of artificial dentures worn are discoloured and by no means devoid of unpleasant odour. This lack of cleanliness, which arises sometimes from neglect, but often from want of instruction on the part of the dentist as to the necessary *modus operandi*, is a fruitful cause of inflammatory conditions. Débris of food mixed with saliva and mucus accumulating on a plate rapidly undergo decomposition, with the result of irritating the mucous membrane and producing a general inflammation of the oral cavity. The oral secretions become altered and vitiated, so as to cause dyspepsia, and caries of the remaining natural teeth is set up, which proceeds with great rapidity, especially in "clasp" dentures, not from the friction, but because the inside of the clasps most generally escape the brush. The materials used in the construction of artificial dentures differ widely in their effect upon the tissues with which they come in contact. A larger number of cases of inflammation of the oral tissue occur where vulcanite is used as a basis than with gold or other metals, and so prevalent is this inflammation in the case of vulcanite that it has received the distinctive appellation of "rubber sore-mouth." Several reasons have been assigned for the effects produced by vulcanite. Nearly all this material is coloured with mercuric sulphide (vermilion), which ingredient has been accused of being the cause of trouble; but an exhaustive investigation did not substantiate this view, one particular point being that "rubber sore-mouth" often occurred where black rubber was used, which contains no vermilion. The porosity of vulcanite, especially when not sufficiently vulcanised, renders it liable to retain deleterious material if not kept scrupulously clean.

Lancet.

TO KILL THE PULP.

By Dr. Frank French.

Having made a free exposure so that I can see it, I touch the exposed portion with pure carbolic acid : then take a piece of crystal arsenic, and with a knife or instrument scrape a very little of it into powder. I then twist a piece of cotton, the size of a pin-head, on a smooth nerve-instrument so loosely that it is easily detached, moisten it with carbolic acid, and take up as much of the arsenic as will adhere to it, and place it upon the exposed pulp, but without any pressure. I then place a small concave metal disk over it in such a manner that it rests upon the walls of the cavity and effectually prevents any pressure upon the nerve ; then fill carefully with gutta-percha. If there is no pressure upon the nerve, you will have no pain. If there is pressure, you will hear from it at once, which means remove and start again. These disks are about one-eighth of an inch in diameter. I usually make a quantity by punching them from thin sheet-iron. Do not, to save a little trouble and time, cover the arsenic with cotton dipped in sandarac instead of gutta-percha. It is a slovenly way of work, and it is not safe. I have seen many cases where the arsenic has escaped from the tooth, destroying the process between the teeth, not unfrequently causing the loss of the tooth itself. I prefer to let the arsenic remain five, six, or seven days, as then the nerve can generally be removed whole. does not break and tear, as it will where it has only been allowed twenty-four hours ; is quite tough and leathery, and can be removed with no pain except when it separates from the live portion. If after three or four days the tooth becomes sensitive to the touch, remove the filling, cap, etc., and it will return to its normal condition in a day or two, when the pulp can be removed. All this takes time, but take all the time necessary to do the work well, and make a proper charge for the service rendered.

Cosmos.

THE DIFFERENCE BETWEEN PRACTISING DENTISTRY IN PARIS AND MINNEAPOLIS.

Dr. J. H. Spaulding, a former Minneapolis dentist who has been practising in Paris for the past five or six years, is in the city, the guest of his brother, Dr. W. A. Spaulding. In his practice among the better classes of the French people he has had an opportunity to compare France and America from a dentist's standpoint, and he makes some interesting observations on the characteristics of the two nations. He finds a striking difference in the way in which the dentist is regarded by his patient. In France the patient places himself more under the care of the dentist; he goes to him to save his teeth and is anxious to have him take whatever course he thinks best. Americans on the other hand, are apt to be dictatorial and are often given to grumbling and finding fault with the dentists decision. The Frenchmen has a greater respect for authority and professional skill.

On one point, however, the men and women of France are firm. They will not have their front teeth filled with gold. They object to wearing conspicious jewelry in their teeth, and insist on having none but white filling where it will show. The gold filling in the teeth of Americans is a source of no little amusement to them. They suppose it is a fad among Americans to have the brightest gold possible in their front teeth ; and some of them actually believe that American women have their teeth set with diamonds.

The Frenchmen's preference for amalgam and cement fillings is entirely irrespective of the cost of the materials. The French dentist charges for his services without regard to the material used. The minimum fee is the same for gold, cement and amalgam fillings and in long operations the charge is regulated entirely by the time required.

A feature of the practice in France which is very agreeable to the dentist is the manner in which the patient pays his fee.

The Frenchman when he settles with his dentist, thanks him for his kindness, attention and delicate manner of operating. An American is apt to think he has done all that can possibly be expected of him when he has drawn a check for the amount of the bill. He regards the affair as a commercial transaction which consists largely in buying so much amalgam or gold, and overlooks the intimate personal relation between himself and his dentist. In France the manifestation of kindly feeling between dentist and patient extends to the exchange of invitations and other social civilities; and this, too, in a country where it is difficult to gain entrance to good society. The Frenchman is loyal to his dentist professionally and in case of removal will patronize his successor, or someone whom he recommends.

Although there are a few lady dentists in France, and more in Russia and Germany, the young lady assistant so common with American dentists is rarely found. Dr. Spaulding has one in his office, and some of his patients have expressed themselves pleased with the innovation, but others object to having a third person around. The patients sometimes insist that no one shall see them at the office. Europeans in general, and especially among the less favoured classes, neglect their teeth much more than Americans do.

The French dentists have a high opinion of the skill and inventive ability of their American brethren, although they consider them a little pretentious and showy in some of their methods. In the manufacture of plates the French dentist excells the American, as that branch of the profession is developed into a speciality, and not left to apprentices and students as in America. *Archives.*

ANTRAL ABSCESS.

Dr. W. C. Barrett thought there were more cases of hyperemia of the antrum than were generally supposed. The antrum was analagous to cavities found in all the large bones of the face, and the lining mucous tissue was the same as that of the oral cavity, and its diseases are those to which mucous membrane is liable. A catarrhal condition of the Schneiderian membrane will cause trouble in certain cases by closing up the natural opening into the antrum. The principal cause of disease in the antrum, however, is the opening into it by the roots of teeth. Sometimes pus forms, and this causes a breaking down of the glands of the mucous membrane. All the treatment necessary is to cleanse out the cavity thoroughly with tepid water, and apply soothing remedies. He advised that they should go slowly about applying peroxyde of hydrogen, and said that he at one time nearly blew a man's head off with it. He had injected into the antrum without allowing sufficient vent for the escape of the gas from the effervescence, and the pressure caused such agony that the man went nearly crazy for the time. His treatment is to rinse out the antrum with tepid water; if there is no entrance caused by the root of a tooth piercing the floor, you may easily open through the buccal wall, but this will not give drainage. To get this, an opening must be made through the floor of the antrum. In case the second bicuspid or first molar is absent, enter through the vacant space, or if the tooth is not sound it had better be sacrificed. Otherwise provide for drainage by piercing the floor between these teeth. It is desirable to have the opening large,—big enough to admit a lead pencil. With an opening of this size it is safe to introduce peroxide of hydrogen. Follow this with emollient remedies, and if pus is present, with an antiseptic fluid just strong enough to keep the cavity aseptic.

Cosmos.

BRIDGE WORK.

By Edouard Blitz, Belgium.

Bridge work here is an old, rotten chestnut (excuse the expression). More than thirty years ago my father learned the process from William Rogers, an English dentist, living in Paris, Rue St. Honore. All old dentists have made such work long ago, and finally abandoned it as being useless. I will add, however, that the old style platina bridge cannot be compared to the beautiful American work. The permanent, or immovable, bridge, never found favour among European dentists, as can be seen in the old advertisements: "Incorruptible teeth, without hooks or ligatures." Desirabode, the father of the dentistry of the XIX century was the inventor of that celebrated phrase "without hooks or ligatures." The band was never employed by competent dentists, being considered, *a priori*, as being fatal to the health of the tooth. The claims of the International Tooth Crown Company are so absurd to a French dentist, that the greater majority of practitioners refuse to believe in the existence of such a monstrous association. *Archives*

FLORAL TOOTH POWDER.

By G. H. Dubelle, Ph. D.

Take of—

Precipitated chalk	200 parts.
Powdered orris root	200 parts.
Powdered bicarbonate of soda	200 parts.
Powdered sugar of milk	200 parts.
Powdered red sandal	100 parts.
Powdered white castile soap	50 parts.
Salicylic acid	40 parts.
Oil of peppermint	6 parts.
Otto rose	4 parts.

Dental Review.

The effect of Amalgam on a gold Band.—A demonstration is a proof. If he takes a band of gold he would soon find that the mercury would attack the gold so as to cause it to give way. You can't put a clasp on that tooth ; it will absolutely unsolder. Mercury and copper will not amalgamate ; it gets hard chemically, but it does not amalgamate. Mercury is free and you can put it over a flame and spew it out. If you put gold in contact with copper and mercury, the mercury will act upon the metal for which it has an affinity. *Dr. Beach in Southern Dent. Jour.*

Reports of Societies.

STUDENTS' SOCIETY VICTORIA DENTAL HOSPITAL OF MANCHESTER.

The second meeting of the Session was held on Tuesday, November 24th.

The President, Mr. W. Simms, in the chair.

The following gentlemen were balloted for, and unanimously elected members of the Society, viz. :—Messrs. Dreschfeld, Leeming, Lees, Sibson, Stevenson, Theakston, Mawson.

Mr. J. C. Lingford then read his paper on "Sensitive Dentine."

In the discussion that followed, Mr. Dougan advocated the use of Caustic Potash, and in small erosion cavities advised searing the surface of the dentine with a heated burnisher.

Mr. F. L. Tanner remarked that a mouth wash of perchloride of mercury (1 in 5000) was useful for constitutional causes, he said mastic and tannin plugs formed very efficacious temporary fillings, and deprecated putting metallic fillings in sensitive teeth immediately, even though the tenderness be temporarily overcome, the tooth should either be lined with oxysulphate of zinc, or have a temporary filling inserted.

Mr. D. Headridge also strongly deprecated the placing of conductive fillings in sensitive cavities, he condemned the zinc phosphates as temporary fillings, and believed that sharp excavators caused less pain than burs.

Mr. J. C. Stokoe did not agree with Mr. Coleman's theory re the sensory function of the dentinal fibrils, he thought that the alveolo-dental periosteum more likely subserved the purpose of judging when food had been sufficiently masticated. He also spoke of Ethylate of sodium as a valuable agent for Sensitive Dentine.

Mr. P. A. Linnell cited a case in which he had administered nitrous oxide in order to remove sufficient decay from a very tender tooth to enable him to temporarily fill it. He also cited a case where arsenic had been employed with success, the tooth being opened up after a long period with the pulp still living, and thought the drug might be used in some cases if proper precautions were taken.

Mr. C. H. Smale in advocating the use of the hot air syringe, said that the blasts of air should be persisted with until the surface of the dentine was thoroughly whitened, he had often found great pain accompany the injection of air ; he had found several times that burs could be tolerated in preference to excavators. Mr. J. T. Sherratt saw that he had been uniformly successful in treating sensitiveness by the patient use of sharp excavators, and such agents as carbolic acid, hot air, and chloroform. He also spoke against placing a metallic filling in immediate contact with sensitive dentine.

Mr. W. Simms advocated the use of sharp burs as well as excavators, he recommended the use of nitrate of silver in buccal cavities of molars, and said that an alcoholic solution of silver nitrate, incorporated with an oxychloride formed a valuable temporary filling, he thought that the great cold produced by the ethyl chloride would make it a painful remedy. He thanked Mr. Lingford on behalf of the Society for his paper.

Mr. Lingford having briefly replied to the points raised, the meeting was brought to a conclusion.

Dental News.

VICTORIA DENTAL HOSPITAL, MANCHESTER.

The 6th annual dinner of the past and present students of this hospital took place on Saturday, Dec. 19th, at the Grand Hotel, Mr. F. Tanner, the lecturer on Dental Mechanics at Owens College, occupying the chair.

A large number of guests were present, including most of the members of the hospital staff, Mr. Copinger, vice-chairman of the committee of management of the hospital, Dr. Ashby, Dr. Stallard, Mr. J. W. Smith, F.R.C.S., the Dean of the Liverpool Dental Hospital, etc.

This year the number of toasts was, in accordance with a very generallv expressed wish, reduced as much as possible.

After the usual loyal toast had been proposed by the president and duly honoured, Mr. J. W. Seville (Exeter), proposed. "The Manchester Medical and Dental Schools," which was responded to by Dr. Ashby for Owens College, Mr. J. W. Smith for the Infirmary, and Mr. W. A. Hooton on behalf of the staff of the Dental Hospital.

Mr. F. L. Tanner then proposed "Our Guests and Visitors," and this was responded to by Mr. R. Edwards (Dean of Liverpool Dental Hospital), and Mr. Copinger.

The last toast was that of "the President" proposed by Mr. G. G. Campion, and drank with musical honours.

During the evening a number of songs, pianoforte and violin solos, recitations, &c., were given by Drs. Ashby and Stallard, and Messrs. C. N. Smale, F. V. Walker, J. C. Lingford, G. Kershaw, H. Dreschfield, and others. It is gratifying to be able to report that the dinner was in every way a thorough success, and everyone agreed that a most enjoyable evening had been spent.

ANNUAL REPORT OF THE BIRMINGHAM DENTAL BOARD.

Gentlemen,—I have to report to you the changes, which have occurred during the year in connection with the Dental Faculty of Queen's College.

Mr. W. Malin, L.D.S., Eng., has been appointed Dental Tutor for a period of three years, in the place of Mr. F. H. Goffe, whose term of office had expired, and to whom was accorded a vote of thanks, and honorarium in consideration of his services.

The following special courses have been inaugurated.

Four lectures on Syphilis and Surgical diseases of the Mouth in their relation to Dentistry, by Mr. Frank Marsh, F.R.C.S.

A short course of lectures on Diseases of the Throat and Nose, and of Digestion, in their relation to Dentistry, by Dr. T. Stacey Wilson, M.B., M.R.C.P.

To be delivered during the Winter Session.

An entrance scholarship value £15 has been instituted to be awarded annually.

The Council have determined to award medals in the special Dental subjects in addition to certificates of honour.

They have also created the following posts, to be held for a term of three years, and have appointed the undermentioned gentlemen to fill them.

Demonstrator of Operative Surgery:—Mr. G. D. Orrock, M.B., C.M., L.D.S., Edin.

Demonstrator of Dental Mechanics:—Mr. F. H. Goffe, L.D.S., Eng. and Edin.

Demonstrator of Dental Pathology and Microscopy: Mr. C. D. Morson, M.R.C.S., L.R.C.P., L.D.S., Eng.

And have voted a sum of money to be suspended in the fitting up of a complete Dental Laboratory where the higher mechanical art will be practically taught.

The following works have been added to the Library:—"The American System of Dentistry;" "Harris's Dictionary of Dentistry;" "Catching's Compendium of Dentistry."

For the use of the Lecturers and Demonstrators, a lime light lantern and appliances of the most modern type, have been fitted in the Anatomical Theatre, and the lectures are now illustrated by lantern slides, to bring the teaching quite up to date.

The Council have honoured me by appointing me Hon. Sec. to the Dental Faculty to be responsible for the management of the details of the Faculty, and for the initialling of Dental Schedules prior to their receiving the signature of the Warden.

During the year the following students have qualified :—

Messrs. C. A. Hodson, L.D.S., Glasgow ; C. D. Marson, M.R.C.S., L.R.C.P., L.D.S., England ; P. T. Naden, L.D.S., Glasgow; G. Foster, L.D.S., Glasgow; A. Berlyn, L.D.S. Glasgow.

Nearly 2000 dental prospectuses have been circulated throughout the Midland Counties, amongst the principal medical men and dentists, and the School has been judiciously advertized in a large number of the leading papers.

It is gratifying to observe that every student who has completed his curriculum at Queen's college, has obtained his diploma in one or other of the Royal Colleges.

From the foregoing report it will be evident, that it is the desire of the Council to make the department complete in all its branches, in every way worthy of the City of Birmingham.

Yours faithfully,
JOHN HUMPHREYS,
Hon. Sec. to the Dental Faculty.

ANNUAL REPORT. BIRMINGHAM DENTAL SCHOOL, DENTAL HOSPITAL REPORT.

I have pleasure in reporting that the Staff of the Dental Hospital are fully satisfied with the progress of the Students during the past year. They have attended regularly and assidiously to their duties as dressers.

The practice of the Hospital has greatly increased during the twelve months. The patients attending, and the number of operations performed being more than double that of the year previous.

The Senior Staff has been increased by the appointment of Mr. W. Palethorp, L.D.S., Eng., Mr. Percy Naden, L.D.S., Glas.. has been appointed House Surgeon ; Mr. J. E. Parrott, L.D.S., Eng., has been appointed Demonstrator.

At the present time the Hospital is open daily for the Students to work from 9 a.m., until 1 p.m., under the superintendence of the Honorary Officers of the day, and the House Surgeon.

A course of special demonstrations are being given to the senior students, and the Demonstrator is taking the new men through the initial stages of their work.

Unfortunately the present Hospital building is totally inadequate for the requirements of the students. A sub-committee is at present seeking a suitable site for a new building, and it is hoped that a scheme will shortly be prepared which will commend itself to the support of the general committee, and the public of the City.

When this is carried out, the Hospital will be as well equipped as any other like institution, for the educational requirements of modern dental teaching.

F. E. RICHARDS,
Hon. Sec. to the Surgical Committee.

APPOINTMENTS.

Mr. Wm. Hern, L.R.C.P., L.D.S., to be Dental Surgeon to the Dental Hospital of London, vice, Mr. Claud Rogers resigned.

Mr. H. Baldwin, L R.C.P., L.D.S, to be Assistant Dental Surgeon to the Dental Hospital of London, vice, Mr. Lawrence Read, resigned.

Mr. T. E. Sherrate, L.D.S., to be House Surgeon to the Victoria Dental Hospital, Manchester.

VACANCY.

Dental Hospital of London. Medical Tutor. Salary, £40 per annum. Applications to the Dean by February 8th.

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GENERAL ANÆSTHETICS IN DENTAL SURGERY.*

By F. L. Tanner.

Mr. President and Gentlemen :—

It may be thought somewhat presumptuous on my part to undertake to address you on such a subject as General Anæsthetics, especially when we remember how ably the subject has been treated during the last few years by some of our first English Anæsthetists. But, to-night, gentlemen, I do not intend going into the question of the physiology of anæsthetics, nor do I propose to consider the less common agents in use, but rather to present to you in a condensed form, the more important facts required in every day practice. But before commencing the consideration of the various agents employed, and their relative value, I may just pause to remark that I think the subject of anæsthetics hardly receives the attention it merits, both in our text books and in the examinations of the various medical bodies. Nor is this state of affairs confined to the examination for the dental diploma. How many men are there on the medical register, whose knowledge of the subject is very meagre ! Now when we reflect upon the responsibility which is undertaken in administering an anæsthetic, does not this ignorance seem very reprehensible ?

It may indeed be argued that Nitrous Oxide is such a very safe agent to administer, that if this only is employed the danger incurred is almost nil. This may indeed be true, still, it seems to be incontrovertibly established that any form of general anæsthesia is a condition of danger, and, moreover, deaths have actually occurred under its influence ; and should we ever have the misfortune to have such an accident occur to a patient of ours, I am sure we should ever after feel ourselves very much to blame if we had the slightest suspicion that, although some prompt action on our part might possibly have saved the patient's life, owing to ignorance or uncertainty we had failed to avail ourselves of the golden opportunity.

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* A Paper read before Students' Society, Victoria Dental Hospital, Manchester.

Besides this, we shall, all of us, have probably from time to time to operate upon patient's under the influence of one of the more potent anæsthetic agents, as chloroform and ether; and although the administrator is supposed to take the full responsibility, still, in case of accident, the assistance of someone, who could keep cool, and who knew exactly what ought to be done under the circumstances, would be invaluable, and might be the means of saving a patient's life. While on the other hand, gentlemen, should we be unable to render the anæsthetist prompt assistance, even though we should be secure from the censure of a coroner's jury, I rather think that our own consciences would not let us off quite so easy.

I am, therefore, strongly of opinion that every person, whether surgeon or dentist, before he undertakes to operate under any anæsthetic whatever, ought to know what to do in any case of emergency.

Well, then, suppose that a patient comes to us requiring an anæsthetic for some minor operation, what agent shall we advise him to take? In the very large majority of cases, with which we as dentists will be called upon to deal, and where only such short operations as the extraction of a few teeth have to be performed, undoubtedly our answer will be Nitrous Oxide. I will, therefore, proceed to the examination of this agent first.

Nitrous Oxide then, the first anæsthetic introduced, is at once the safest, quickest, and more pleasant of all those at present known. But of the large number of cases in which it has been administered, probably some millions, there has not been a single death directly attributable to the gas itself.

The greatest drawbacks to its employment are, the difficulty of carrying it about, and the very short time that its action lasts. The former disadvantage matters but little in dental practice, or whenever the operation can be performed at the rooms of the anæsthetist, but where it is desired to administer it elsewhere, it will always somewhat restrict its employment. The latter defect, can to some extent, be remedied by means to be presently considered, We are so constantly being asked "Do you think that I am strong enough to have gas?" that I think it will be well to consider briefly if there are any cases in which its inhalation should be absolutely forbidden. From time to time a number of diseased conditions have been brought forward, in which it has been suggested as advisable, not to administer any anæsthetic, but I think we need hardly consider them in detail, since we may lay down the broad rule, that if an operation is necessary and will not occupy more than two or three minutes, it will be safer under the anæsthetic influence of the gas, than without it. However, where extensive disease of the circulatory or respiratory system exists, any excitement is a source of danger, hence additional risk is incurred in these cases, and extra precautions should be taken. Indeed, in these cases, all operations should be avoided if possible, still should one be unavoidable, there is less likelihood of serious results from shock under the anæsthetic, than without it. Should we ever be called upon to operate in such a case, it would be wise to insist upon the presence of a medical man, who would relieve the dentist of all legal responsibility should an accident occur.

There are, however, one or two conditions in which it is advisable that the administrator should know that variations may be expected.

In phthisical and anæmic persons, the anæsthesia deepens after removal of the face-piece, so that in these cases, the administration should cease immediately symptoms of stertor appear.

In apoleptic patients, with short thick necks and of full blooded habits, care should be taken to keep the head inclined slightly backwards, rather than forwards, and to see that their necks are perfectly free from all restriction, as there is danger of compressing the veins of the neck and preventing the free return of blood from the head.

In persons with red faces and dilated capillaries, most of whom are addicted to alcohol, struggling may be looked for.

It is, however, with hysterical patients, that we shall probably experience most trouble. In some cases, they struggle so violently that it is useless to attempt any operation, while in others they appear unable to rouse themselves; should, however, the breathing continue regular, this lethargy need cause no alarm. All that can be done in these cases is to combine kindness with firmness.

In cases of struggling it is best not to exercise undue restraint, as this only increases it. Simply prevent them from injuring themselves, and when the stage of complete anæsthesia is reached, all reflex action will be abolished, and they will generally become quiet.

It is advisable not to administer the gas more than twice on the same day, and if possible, not more than once ; while if several days, or even a week can be allowed between each administration it will be better.

Preparation of the patient. Owing to the almost entire immunity from fatality which has hitherto attended the administration of nitrous oxide, we are very apt to become somewhat careless with regard to the preparation of the patient, and in one accident at least, this was undoubtedly the cause of death.

In order that the respirations may be free, particular care should be taken to see that the clothing is perfectly loose about the neck, chest and abdomen ; and if we are wise we shall never rely solely upon the patient's word in this matter. As a rule it will be sufficient to unfasten the upper buttons of the coat or dress, and remove the collar and broach if worn, should however there be any suspicion of tight corsets, the patient should be requested to take one or two deep inspirations and the movements of the chest well watched; and should it be discovered that freedom of movement is not allowed, the loosening of the tight garments must be insisted upon. To some this attention to preliminaries may seem unnecessary, but that it is not was forcibly brought home to us by the fatality which occurred two or three years ago at Edinburgh, where a lady, aged 71, was so tightly laced, that when under the influence of the gas she ceased to breathe, and as she was the subject of extensive heart disease, her life was lost through cardiac failure, consequent doubtless upon the hampering of her breathing induced by tight laces and a distended stomach.

To operate under the most favourable circumstances, the operation should be fixed for as early in the day as convenient, and only a light meal partaken of two or three hours previously. The patient's stomach is then in the natural course of events comparatively empty, and the patient has not had much time for brooding over the approaching operation, while the whole system is in a better condition to stand the operation after the night's rest. In the case of delicate and very nervous persons the observance of this rule will be found especially useful.

While it is never advisable to administer soon after a full meal, previous fasting is neither necessary nor advisable. Indeed one of the great advantages of the gas is that so little previous preparation is requisite.

In the case of young children and hysterical females it is advisable that the bladder and rectum should be evacuated a short time previously, otherwise there is danger of an accident at once distressing to the patient and destructive to an elegantly upholstered chair.

I need hardly remind you of the necessity for examining the mouth to see that all foreign substances, as artificial teeth, are removed. Spectacles and eye glasses should also be removed from the eyes, and gloves from the hands.

Should the patient complain of faintness administer a little weak brandy and water, or a teaspoonful of Sp. Ammon. Aromat (Salvolatile). With regard to the question of the examination of the patient, while some eminent authorities, including Mr. Braine, advise that a superficial examination be made in all cases, rather with a view to satisfying the patient and putting one's self on the right side in event of an accident, than of gaining any precise information ; others, as Sir Joseph Lister, maintain that such examination is inadvisable, even for chloroform, as it only tends to alarm the patient and raise groundless fears.

I think, gentlemen, that we should generally steer a course between these two extremes, and lay down the rule that while in the majority of cases no examination is necessary or advisable, should either the patient or their friends show any desire for such examination, a superficial one may be made to satisfy them, by feeling the pulse, and examining the movements of the chest walls, and possibly placing the ear for a moment over the heart. The administrator should make every effort to win the patient's confidence, and must make due allowance for the nervous condition in which they are often found.

As a rule, it is not advisable to have more than one person present, and that one should be requested to sit still, and not interfere in the operation at all, and should be so placed as to be unable to see the patient's face, as a nervous person might be alarmed by the appearance.

But while the presence of several persons in the room is to be avoided, it is wise always to insist upon the presence of a third person when administering to females.

Apparatus. Seeing that the successful administration of nitrous oxide depends very largely upon good apparatus, I think it will not be time lost if we for a few minutes consider what is the most perfect apparatus at present in use.

Of face-pieces Clover's has been in use the longest, and is at once simple and efficient, and it has the advantage that a fresh air-pad can be at any time fixed in a few moments. Somewhat similar ones are the so-called flexible face-pieces, though differing a little in shape. This, though the air-pad is fixed, I think a little more comfortable to the patient.

More recent ones are those of Barth & Co., and Dr. Hewitt's modification of Barth's specially adapted for nitrous oxide and ether combined.

In these two, the valves, instead of being attached to the face-piece, are fixed in the stop-cock, hence are available for any number of face-pieces, and consequently a new face-piece costs rather less than half the amount of one with valves. Of Barth's, No. 2 is preferable, as in this the expiratory valve can be thrown out of action, and the gas breathed from and re-breathed into the bag if desired, which thus acts as a supplemental bag. Besides the above advantages, it is very simple and compact, and not at all liable to get out of order. This is the face-piece and stop-cock I prefer.

Dr. Hewitt's is very similar, only the valves work differently.

In America, the most common form of inhaler consists of a hard mouth-piece, which passes between the patient's lips, though face-pieces are coming more largely into use even there. The only cases in which such a form seems to me to be advantageous are for men with very bushy beards, but even here with a little contrivance the ordinary face-piece can be made fairly air tight, though it may now and then be necessary to smear the beard with a little soap or vaseline.

Whatever form is selected, it should have an effectual expiratory value to abolish any asphyxial phenomena from nitrous oxide narcosis.

With respect to the employment of a supplemental bag, the pretty general concensus of opinion seems to be that it is inadvisable, since rebreathing exhaled air or gas means taking back into the lungs and pulmonary circulation the poisonous refuse exhaled from the epithelium of the respiratory tract ; though such an authority as Mr. Braine says he has never seen any deleterious effects from the practice ; and moreover' according to some observations made by Dr. Hewitt, th available period of anæsthesia in these cases is nearly half as long again, but a longer time is required to induce the anæsthesia ; still I think it cannot be doubted that headache and other ill effects are more likely to be experienced if this method is employed ; and Dr. Dudley Buxton strongly objects to any such practice. Should, however, it be desired to let the patient breathe backwards and forwards into the supply bag, this can readily be accomplished by closing the expiratory valve, and no separate supplemental bag is required at all. In the olden form of facepiece with the valves situated in it, I should recommend that the inspiratory valve be removed, as practically it is of little use, and it would of course prevent the reservoir bag being converted into a temporary supplemental bag.

Most administrators advise that the reservoir bag should be as near the face-piece as possible, though a few prefer to have a tube of large diameter between the bag and face-piece, the former is the least cumbersome and probably the best method. Should, however, some tubing be employed, it should be sufficiently large in diameter to admit the gas so freely, that the most nervous, as well as patients with weak lungs, can inhale through it without exertion. It should be at least three quarters of an inch diameter inside, so as to be nearly the same size as the human adult trachea. Should it be smaller than this, the patients, feeling suffocated, begin to struggle for air just as they are losing consciousness, and the administration is rendered much more difficult. This fault is probably to some extent the cause of the complaint one occasionally hears from patients who have had the gas, that the most disagreeable part was the feeling that they could not breathe freely, and were being suffocated.

A Cattlin's bag of about three gallons capacity is the most convenient size. The larger ones are only in the way, and besides this, it is more trouble to keep up slight pressure on the contained gas.

Silencers are sometimes employed, but their advantage is very questionable. It is very rare for the patient to raise any objection to the slight hissing noise caused by the escape of the gas into the bag, while they are very likely to harbour impurities.

Though the gas can be prepared by the anæsthetist himself if he likes, the liquid form, in which it is now supplied by several firms who guarantee its purity, is so convenient, that, except in out of the way places, it is hardly worth the trouble.

The practice of passing the gas first into a gasometer is largely going out, and it is becoming very general to pass the gas straight from the bottle into the bag. It is advisable always to have a second bottle at hand in case the one in use should run out. During cold weather it occasionally happens that the valve of the bottle becomes frozen, and no gas will escape, especially if the bottle has been lying on its side. The bottle must be placed in a warm place, but not too close to the fire for fear of an explosion.

For connecting the two bottles together and to the tubing several forms of attachment are in use. In the one most commonly employed, the bottles stand upright in an iron stand, and are connected by a union at the top, to which the tubing is attached. In using this apparatus, it must be placed on a chair or other suitable stand close to the administrator. A much more convenient form of apparatus, especially when the operator is compelled to administer himself, is either Mr. Edgelow's improved pedal attachment, or what is still better and far steadier the one recently introduced by Mr. Weller (See Ash's Quarterly Circular, December, 1891). In both of these the bottles lie horizontally. The great advantage in these forms, is that either bottle can readily be turned on by the foot of the anæsthetist, thus leaving both hands free. I would, however, suggest a slight alteration in Mr. Weller's form, namely, that instead of having the bottles quite horizontal, the valve end should be raised slightly higher than the other, so as to prevent the liquid collecting and becoming frozen around the valve, which is the great objection to having the bottles lying down. This could readily be accomplished by a slight alteration in the apparatus. This would then be the most convenient apparatus of any at present in use.

The neatest and theoretically, most convenient apparatus of all, however, is that lately brought out by Mr. Smithard, (see Ash's Quarterly, Sept. 1891), where the bottles stand vertically in a wooden case. Here the gas can be turned on by simply pressing the pedal with the foot. Besides the bottles, the case will also hold the gas apparatus, and were a drawer added, could also be made to hold such accessory apparatus, as gags, mouth opener, tongue forceps, &c. Unfortunately, there is not sufficient control over the escape of gas from the chamber to the gasbag by means of the pedal lever.

Unlike chloroform and ether the muscles of the patient generally become rigidly contracted while under the influence of nitrous oxide, hence gags, or mouth props, as it is advisable to call them when speaking of them to patient, are indispensable in operations about the mouth, and indeed, in all cases they are advisable, as with the mouth kept open the breathing is easier, the anæsthesia more rapidly induced, and should it be necessary, the tongue can be readily got at. They should be of some hard, strong non-absorbent substance, which can readily be kept clean, and for this purpose, either metal nickel plated, or hard vulcanite answer admirably. The ends should be of softer rubber, or gutta-percha to prevent them slipping. For the very large majority of cases, either the ordinary vulcanite ones, or Dr. Hewitt's which is similar, and being made of steel is very strong, are best. Two of these should always be connected together by a piece of strong string, catgut or silk. A cork, with a wedge shaped incisor at each end makes a clumsy makeshift, but is not very strong, and being absorbent should never be used more than once. When the gag can be placed at the side of the mouth one of these simple forms are preferable, and superior to either spring or screw gags.

Such mechanical gags as Buck's, though virtually good, are dangerous in practice from their liability to break, besides which they are not so readily kept clean. At times, however, it is necessary to operate on both sides of the mouth during one administration, and in these cases a spring gag placed between the front teeth will be found most useful. The best is probably the new spring gag, which is self adjusting, or else the adjustable steel gag, which can be regulated by a thumb-screw to any desired height. Both of these can be readily swung aside against the cheek out of the operator's way. They are made by Messrs. Ash & Sons.

In the choice of a gag one of the simple ones placed between the molars or bicuspids is always to be preferred. Should it be absolutely necessary to place it between the incisors, if possible let it rest on more than one tooth in each jaw, and see that these are firm and do not project much, otherwise there is danger of one of them being forced out of its socket. Should such an accident occur, the tooth should be simply replaced, forcing it well up into place.

Another appliance which should always be at hand is Mason's mouth-opener, in case the ordinary gag should slip

The long handled ones are best. A pair of tongue forceps are also very useful to pull forward the tongue in case of necessity. Those of Mr. Woodhouse Braine are the best, the sharp serrations being of great service in securing the tongue, and the slight puncture which they make probably assisting the reflex stimulus.

It will also be found very handy to have either a few pieces of sponge mounted in holders, or what is nicer, one of the new wool holders made by Ash and Sons, so that the mouth can readily be mopped out.

To be concluded.

ON A NEW METHOD OF MOULDING AND WORKING CONTINUOUS GUM.*

By J. Hooton, L.D.S. Ireland.

In the old days, when it was the universal custom to use natural teeth for incisors and canines, and blocks of hippopotamus tusk for bicuspids and molars, the process of letting down the blocks was laborious and lengthy, and the blocks themselves were perishable and unclean. Then came the days of imperishable and clean mineral blocks, about which time I commenced my dental education.

These mineral blocks were even more difficult to fit than the so-called bone blocks, and it fell to my lot in those early days to work in this manner. It was also the custom for some of us to experimentalize in the actual manufacture of mineral teeth and blocks.

With this prelude, I may at once state that I have made endless researches for many years to prepare a mineral tooth and gum substance which should neither shrink nor crack in burning. It is needless to expatiate on the labours undergone in this pursuit; suffice it to say, that at last I found a so-called body which does not crack under the highest heat, and which shrinks hardly at all, and which I have "fired" in half-an-hour. But I am chiefly concerned to-night in describing an appliance designed with the object of moulding the teeth and gum substances in a manner which shall be universally applicable to any form of mouth or gum, and with a series of matrices of different types of teeth it is now possible, by a simple method, to adapt the one to the other by one process.

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* Read before the Odontological Society.

This process is equally applicable to gold plates or to vulcanite without the need of platinum, which is important, so that either partial or complete sets can be moulded just as easily as vulcanite, and I trust before long to be able to demonstrate that the actual firing shall take a less time than vulcanizing.

I will now proceed to describe the whole process in detail. First of all comes the preparation of the moulds, or matrices. These are made by mounting sets of teeth of various types and sizes in wax, and about seven or eight types are sufficient for ordinary work. These wax patterns, as we will call them, are not fitted to any gum outline, but are simply contoured to the form of an upper or lower maxilla, and are made quite flat on what would be the gum surface; in other respects they are exactly what a set of artificial teeth would be, except as to the gum outline.

These form the male part of the mould, or matrix, which is cast in plaster of Paris in two parts. These parts are trimmed into shape, so as to be reproduced in brass or gun metal in the manner here represented, so as to be clamped together by pins, and on the upper surface a metal plate is cast, like the lid of a vulcanizing flask, except that it has three countersunk holes and a central hole, through which passes a screw, upon which a winged nut works to clamp the whole in one. The outer part of the matrix is hinged in four sections.

The manner of using the apparatus is as follows:—An universal articulator is prepared, and into it is fixed by set screws a zinc model of the case to be treated; upon this is placed a very carefully trimmed wax bite, just of the exact dimensions and outline of the future plate. Around the outside of this is adapted a soft brass plate, which can be roughly moulded to its external outline, and which works on a moveable articulating frame, which is removable and replaceable in its exact position. This indicator is adjusted approximately so that its edge shall be in the same plane as the edge of the bite, and its inner surface is adapted to the outer surface of the bite.

The wax bite is now removed, and a wax counterpart of the inside of the brass mould or matrix most suitable to the case is made by pouring melted wax into it. This has a flat surface on the gum margin, as before described, and it is adapted to the zinc model by simply heating this sufficiently to run down the wax until its masticating surface is parallel to the edge of the brass guide or indicator. Before the zinc is heated it is needful to remove the articulator, so that it does not get hot with the zinc, but it is replaced in its exact position before the wax counterpart is run down. We have now a wax bite outlined with teeth and gums, just as it left the matrix, but its gum surface, instead of being flat, is an exact counterpart of the zinc model. It is now returned to the brass mould or matrix, and fusible metal is melted and poured in through one of the three holes in the lid, which are countersunk. It is well to put a morsel of tissue paper on the wax, just where the type metal is poured in, so as not to melt the wax unduly at that point. The matrix is quickly opened by withdrawing the pins, and the wax removed.

It is needful now to call attention to the fact that holes parallel to one another have been drilled in the lower part of the matrix, so as to allow of pins being passed through in suitable positions to form the pin holes in the blocks. Slits are also sawn in the mould or matrix, behind the canines on each side, so that strips of thin brass can be slipped in to divide the mould into three parts. Into the pin holes are inserted pieces of steel knitting pins of pivot-wire gauge, and on to them are fitted the platinum tubes wherewith to line the pin holes in the gum blocks. A plate of copper is put under the matrix, so that the pins will not drop out in the subsequent proceedings. The mould or matrix is now clamped together, with the exception of the lid, and the "body" is packed in a moist condition, so that it can be shaken down into the mould just like pouring plaster into a wax impression but it can be packed down and shaken, as it does not set like plaster. The lid is now placed upon it, and hammered down gently and firmly by the handle of a hammer, used endwise, and finally screwed home by the set screw before described as a winged nut. The mould or matrix is now placed over a gas heater, and left until the fusible metals runs out, by which time the water will have been driven out of the "body" substance. The outer part of the mould or matrix and the lid are now removed, and the excess trimmed away from the blocks. These blocks can be removed from the matrix by tapping it lightly and sharply with a hammer, but it is needful, of course, first to withdraw the steel pins and the brass dividers.

The next step is to paint the gum surface with gum enamel, and to tint the necks of the teeth themselves with suitable colours, if the teeth are required to be shaded, and it is well to do this to the outside of the gums and teeth before removing them from the mould or matrix. The blocks are now ready to be fired, but it is well to dry them still more by dry heat for half-an-hour before placing in the muffle. The muffle should not be closed until the oil and starch are driven off. Starch is mixed with body compound so that it will still work more like clay, and it can be trimmed and adjusted to the bite by suitable "sculptors."

I do not propose to go into the question of firing, because this depends so much upon the form of muffle and upon the gas supply, but I hope to say more about this on a future occasion. Suffice it to say that with the body compound* this process can be adapted either to complete sets or to partial cases, and for bridge work should supply a very beautiful and simple result. The chief difficulty is in the preparation of the moulds or matrices, but when these are once prepared they will do for any case, and the actual labour entailed in the hands of a skilled workman will produce a result surpassing the ordinary continuous gum, because it can be done in less time than vulcanite work, with a result far surpassing the latter in appearance, and being much lighter than the former.

My invention relates to the manufacture of artificial teeth with continuous gums, and to fitting the same to the mouth of the patient, and the chief object of my invention is to enable a whole set, or part of a set, of artificial teeth to be made and fitted to the mouth of the patient by one and the same process. Having taken as usual an impression or cast in wax of the gums and palate of the patient, and from this prepared a plaster cast in the ordinary or any convenient manner, I prefer to take from this plaster cast a zinc cast. This metal cast is then secured on a plate or frame by means of thumb screws or otherwise. I then take a section or piece of wax, which piece has been moulded in the mould hereinafter explained, and I heat the cast, so that by pressing the moulded piece of wax upon it the superfluous wax is melted down and an impression of the patient's gums is obtained, and while the wax is still there I adjust or regulate the position of the piece by means of a guide consisting of a soft metal strip supported by two rods free to slide horizontally in a block. When the position of the strip has been adjusted to a wax bite, placed on the metal cast by sliding the rods, the latter are fixed in position by means of a screw or screws. The block is supported by a standard on which it may be adjusted, vertically, or axially, and then screwed by a screw. By means of this guide I am enabled while the wax is melting to adjust or regulate the position of the piece to suit the pecularities of the patient's mouth, such as the angle at which the teeth are set, their length, and the projection of the gums. The finished wax cast thus obtained is placed in the mould already mentioned.

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* This may be obtained ready prepared from S. S. White's.

This mould, which constitutes an important part of the invention, is of suitable size and represents a complete set of teeth and gums. The mould is made in three parts, namely, the body or main portion, the front or side piece, and the top or cover. The front portion is made in four parts, which are hinged together for greater convenience in opening and closing the mould, and when closed the portion is secured in position by two pins. The cover has holes or openings in it and is secured to the body by a screw and nut.

The wax cast having been placed in the lower part of the mould, and the mould closed by securing the piece and the cover, I run fusible metal through the holes on to the wax, so as to obtain a correct impression of the surface of the patient's gums. The cover with the cast adhering to it is removed, the mould is then opened, the wax removed, and the mould oiled and the front part again closed ready to receive the composition from which the teeth are to be cast. The artificial teeth are formed by placing a sufficient quantity of this composition in the mould in a pasty or semi-liquid condition, the quantity of the composition being regulated by the number of teeth required.

In the lower part of the body there are a number of pinholes, one opposite each tooth, and steel pins are passed through all or some of these holes, and project through the mould up to the fusible metal. The pins are cut off close to the mould and are kept in position by a copper disc underneath it. A small platinum tube is passed over the projecting part of each pin previous to the composition being placed in the mould as above described, so that the platinum tubes are embedded in the composition. The cover with the cast still adhering to it, is then placed upon the body and secured to it by the nut in such a manner that the cast is pressed firmly down upon the composition in the bottom part of the mould, and the composition is thus moulded simultaneously into the form of a set of artificial gums and teeth, exactly fitting the mouth of the patient, and agreeing with the finished wax cast.

The mould is now slowly dried and heated until the fusible metal is melted and runs out when the mould is tilted over. The fine edges of the mineral are thus preserved and an undercut can be obtained. The pins are then withdrawn, leaving the platinum tubes in position. The mould being opened the blocks are removed, and are ready for firing when the gum has been coloured. One firing is sufficient. If the blocks are to be mounted in vulcanite after the firing, pins are inserted into the tubes and made to project, head downwards, into the rubber, which runs in between the tubes and pins, and so affords a secure hold.

In conclusion, I must express my regret that I have not been able to condense my remarks, but the work itself is really much more simple than its categorical description on paper. I should like to say that this process has been a special hobby, and has occupied much of my spare time, and if the profession can gain any benefit by my labours I shall be amply repaid for all my trouble.

EVOLUTION AND DISEASE.*

By R. Denison Pedley, F.R.C.S. E., and L.D.S.

In seeking for a subject which might be of some interest to us this evening, I came to the conclusion that I could not do better than direct your attention to a remarkable book which is published in the Contemporary Science Series entitled "Evolution and Disease." The author is Mr. Bland Sutton, an eminent pathologist, whose name is, or should be, familiar to all students in our profession, by reason of the interesting papers he has read and published, and the researches he has carried out in connection with the pathology of Dental Tumours.

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* The Valedictory Address, delivered by the President to the Students Society of the National Dental Hospital.

It is neither desirable, nor would it be possible for me to attempt any exhaustive summary of this work. Every chapter is full of wonderful and interesting facts, and any one of them would afford an evening's entertainment. I shall content myself with pointing out the general scope of the book and then pick out a few facts, quoting freely from the author.

The author's object in writing on such a subject is to indicate that there is a natural history of disease, as well as of plants and animals, and to illustrate general principles by a number of selected examples. The difficulty of defining disease is clearly pointed out, also the difficulty of investigating diseases among animals. The structural similitude between man and animals closely allied to him, would induce us to believe that there is a close alliance in diseased conditions. If the "gradual evolution of complex conditions from simple organisms" is applicable to structures of the body in health, it necessarily follows that evolution should apply to those structural alterations which we call disease, "in plain words there has been an evolution of disease *pari passu* with evolutions of animal forms"

As the result of his researches, the author says he "quickly saw that the manifestations of disease were regulated by the same laws which govern physiological processes in general, and that many conditions regarded as pathological in one animal are natural in another." Of this some striking examples are given. In rare instances children have been born with tufts of hair growing from the inside of their cheek. This, of course, is abnormal, but inside the cheeks of rabbits, hares, and porcupines, patches of hairy skin are natural.

"The close relationship existing between physiological and pathological processes is shown in an interesting manner," by comparing the development, growth, and falling of the antlers of the deer, with the pathological processes which take place when the separation of periosteum from a bone results in necrosis.

The author draws his examples of disease from "animals other than man wherever practicable," as he considers that in man they have been too exclusively studied. By studying diseases in man alone, our notions of diseases are crude.

"In the ensuing chapter the following plan has been adopted : The effects of increased use and disuse of parts is considered in connection with the gradual change in the functions of organs, and the part played by the transmission of the effects of increased use and disuse in producing vestigal structures in complex organisms. The tendency of vestiges to become diseased or to give rise to conditions disadvantageous to the individual is fully dealt with. The important and interesting subject of the transmission of acquired character and malformations is briefly discussed, and a chapter is devoted to causes of disease arising without the organism, and the relation they bear to the remarkable processes, inflammation and fever. Tumours are considered in connection with general morbid processes, and the scanty knowledge we possess of the zoological distribution of disease is summarized."

THE ZOOLOGICAL DISTRIBUTION OF DISEASE.

The distribution of diseases among animals is an exceedingly interesting subject, and a short description forms one of the best chapters in the book. The information we possess on this subject is small, and the difficulty of obtaining facts with regard to wild animals is well illustrated by Dr. Falconer in explaining the scarcity of remains of quadrumana in geological strata. "When the monkey pays the debt of nature, his carcase falls to the ground and immediately becomes the prey of the numerous predaceous scavengers of the torrid regions, the hyæna and the wolf. So speedily does this occur, that in India, where monkeys occupy large societies in mango groves around villages, unmolested and cherished by man, the traces of casualties are so rarely seen, that the simple Hindoo believes that they bury their dead by night."

As far as the author's investigations have extended, he finds that "excluding the affections known collectively as the acute exanthemeta (scarlet fever, measles, small pox, and the like), that most diseases known in the human species occurs in mammals."

Animals differ so much in their habits, structure, and surroundings, that we might naturally suppose that their diseases differ, and this is so to such an extent, that many may suffer from the same disease, differing in so many ways as to be described under different names.

Tuberculosis, which is so wide spread among civilized nations, and extends over "every part of the habitable globe" has been proved by Koch to be due to a micro-organism, the tubercle bacillus. Since this discovery many diseases which were formerly thought to be tubercular are now shown to be due to other causes, and on the other hand many affections which were believed not tubercular have since been proved to be due to the tubercle bacillus. The disease is "very common among cattle under the name of grape disease' or its German equivalent, Perlsucht. Monkeys living in confinement in this country are occasionally attacked by it. Among grain eating birds the disease is a perfect scourge, the flesh eating birds are not so liable to contract it, and are probably not infrequently attacked in consequence of devouring tubercular grain eating birds. In quadrumana and man the disease runs a similar course" In cattle the disease runs a different course, also in birds. The lesion in man, cattle, and birds are so different that "were it not for the existence of identical micro-organisms" it would be difficult to believe that they suffer from the same disease.

Anthrax which is due to a micro-organism, the anthrax bacillus is a destructive disease among animals and is known as splenic fever. "This disease can easily be communicated to the ox, sheep, rabbit, and guinea pig, by injecting into the circulation a small quantity of blood taken from an animal which has died of splenic fever. Such injections are rapidly fatal. On the other hand it is difficult to inocculate the dog and pig, and fowls never acquire the disease." It has been shown by Pasteur that with fowls the immunity from the disease is due to the fact that the body temperature is too high for the anthrax bacillus to flourish, for when the temperature was reduced, fowls could be inoculated readily. On the other hand the body temperature of the frog is low, but when raised the bacilli will flourish.

"Such facts as these throw great light upon the restrictions of diseases to particular groups of animals, and it explains the readiness with which the tubercle bacillus flourishes in man, for experimentally it has been found to develope most luxuriously at a temperature of 98.6 to 102.2 Far. This would serve to explain the rarity of tubercular lesions in cold-blooded animals."

Gout in man is a disease which affects the cartilages and other textures of the joints. In them is found deposited a crystalline substance called urate of soda, known generally as chalk stones. In pigs who suffer from the parasitic disease known as Trichinosis, "the parasite Trichnia spiralis when hatched finds its way into the voluntary muscles of man and the pig, these become encysted, and in due course is surrounded by calcarious particles." These crystals answer to the test of guanin, a substance closely allied to urate of soda, and this substance becomes deposited in the joints, producing exactly the same changes both to the naked eye and under the microscope, as takes place in the joints of man.

"From the hog we may turn to parrots, which frequently present in their subcutaneous tissues, cartilage, skin, muscles, and intestines, nodules which, in their naked eye characters, are indistinguishable from gouty nodules as seen in man." On examining this deposit it is found to be composed of "a white mortary looking substance in every way resembling that known as chalk (urate of soda) in human gout.

Osteo arthritis, the so-called rheumatic gout in which the ends of the bones are enlarged, and the structures of the joints destroyed has a wide zoological distribution. "I have detected the disease in the joints of a snake's backbone in birds of various kinds, including the neck of an ostrich, in cats, sheep, kangaroos, bears and many others. It is as far as I can ascertain the most widely diffused of all the bone diseases to which vertebrated animals are liable."

Rickets is the commonest disease known among the children of the poor, though it is by no means confined to them. It is due to a deficiency of lime salts with the food and unhealthy surroundings. The principal features of rickets are enlargement of the articular ends and softening of the bones producing deformities of the limbs, when the necessary pressure is exerted in their use. This is associated with various disorders of the stomach and intestines. "This disease affects, besides men, chimpanzees, orangs, gibbons, macques, baboons, capuchins, squirrel, and spider monkeys, and lemurs. Among carnivora we find it in lions, tigers, hyænas, bears of all kinds, and in the domestic cat, the dog, fox, raccoon and seal. Among ruminants it occurs in deer, sheep and goats. In rodents, the beaver, porcupine, rabbit, and coypu rat are affected by it. Among marsupials, the kangaroos, phalangers, and oppossums are most liable. In birds it has been found in the emu, ostrich, rhea and pigeon." There are other diseases which I might mention as being freely distributed among animals, but the time at my disposal will not permit. I will conclude with one more extract from Mr. Bland Sutton's work. "As far as our knowledge of diseases at present extends there are two affections peculiar to mankind, viz. true leprosy and syphilis. Even mental affections occur in animals; we have already seen that the form of idiocy known as cretinism is recognized in calves, dogs and lambs. Horses are certainly known to suffer attacks of acute mania, and dogs become demented and are occasionally imbecile, not recognizing their master from other persons, and forgetting their own names. From being keen at sport, they fail to recognize a hare or partridge, even blunder over them in a field and take no notice of the game when it rises.

"Convulsions caused by troubles during dentition are well recognised in dogs, as well as a nerve affection, closely similar to epilepsy. The remarkable affection of human beings, termed locomotor ataxy, and the singular St. Vitus' dance, or chorea, occur in dogs."

CLEAR SHELLAC VARNISH.

To get an absolutely clear solution of shellac has long been a desideratum, not only with microscopists, but with all others who have had occasional need of the medium for cement, etc. It may be prepared by first making an alcoholic solution of shellac in the usual way; a little benzole is then added, and the mixture well shaken. In the course of from twenty-four to forty eight hours, the fluid will have separated into two distinct layers, an upper and alcoholic stratum, perfectly clear, and of a dark red colour, while under it is a turbid mixture containing the impurities. The clear solution may be decanted or drawn off with a pipette.

National Druggist.

British Journal of Dental Science.

LONDON, FEBRUARY 1st, 1892.

DENTAL HOSPITALS.

Dreamers we all are; builders of castles in the air; followers of "will-o'-the-wisp" fantasies; planning for the future, thinking of the past, how little do we consider the present. That which is, is, and we seldom stay to consider its uses or its needs. Usage dulls the edge of reason, and our surroundings seem so part and parcel of ourselves, that we hardly realize that much we have, we used not to have, nor can we fancy having once again to do without these things. As with the individual, so with the public. The present generation hardly realize to the full, how much they have to help and relieve them, but which a short space of years ago they would not have had. Nor can they fancy what existence would be like, did these things cease to be. Think of the poor were there no hospitals. Situated in our midst, working quietly but steadily, even we, who are most in touch with Hospitals, hardly realize the greatness of the work they do. Whilst health and strength hold out, troubles we have and troubles we shall have, but they can be borne. It is when the body aches that the mind grows weary; it is then that we appreciate the helping hand. As a nation, we have no need to accuse ourselves of lack of charity, but, as hospital men, we may well ask how it is that during the last year or more, the giving public have rather turned aside from Hospitals and the money has flown in other channels. We may well wonder if they imagine what it would be, were there no

Hospitals. This of course can never be. If Hospitals, supported by voluntary efforts fail, then State supported ones must take their place. We have no fear of this. These temporary aberrations of the giver will pass and the Hospitals' difficulties will be things of the past.

Turning from the wide field of Hospitals in general, to those concerned with our own speciality, we must confess we have at no time noticed that public support to which, we believe, they are entitled. It is an open secret, that were it not for the support given by members of the Dental Profession, these Hospitals would neither have come into existence, nor would they be kept open. Now, we are far from saying that the Profession should not support these institutions, on the contrary, it is clearly their duty, and should be their pleasure, not only to give themselves, but to urge others to do so also. At Hospital, men have learned their work, to it they are indebted for the skill they possess, and from it they must look for assistance to help them when such is needed. And because they may object to some of the rules and practices of these institutions, is no reason that they should stay their hand. Give and then grumble, if need be, but those who do not give should neither grumble. We are all for the ventilation of grievances ; out with them by all means, and then we can see if they be true or no. We are no blind worshippers of Hospital management. Many a patient gets relief there who should go elsewhere and pay. Members of the staff are far too lax in this matter. A very understandable, but much to be condemmed reticence, prevents their interfering, where plainly it is their duty to do so. And further, this non-interference does the Hospital much harm in the long run.

But after all, it is to the public these charities should appeal and we cannot help thinking that our Dental Hospitals are not sufficiently vigorous in this direction. It is a difficult question we know, but still we do think the claims of these institutions could be brought more prominently forward. The Irish Correspondent of the *Lady's Pictorial* in a recent issue, put the claims of Dental Hospitals very pertinently before her readers. From her remarks we quote the following :—" The very *saddest* cases connected with this matter come under my own special notice. I know at present a pretty young girl of nineteen, very sadly circumstanced in consequence of being compelled, by pain, to submit to melancholy disfigurement, without hope of being able to collect sufficient money to supply the losses necessarily sustained. The matter is keeping her out of employment, though she is a deft and conscientious worker at her calling. I know, just now, servants who are enduring untold agonies, wakeful nights, and days of suffering and often blame, rather than submit to operations which will, they know, lead to disfigurement, and consequently to loss of bread. Surely these are solemn thoughts, and open up a vast sphere of responsibility, especially for those who are blest with means to bestow for charitable purposes." If only the public can be made to see the matter in this light we have little fear of the result. But they must first be made to do so.

At a recent meeting of the Pathological Society, Dr. Leonard Guthrie showed a toad whose death had been caused by Larvæ of Blow Flies having attacked its mouth and nostrils. The nostrils formed one large cavity, separated only by a thin septum of skin anteriorly ; both eyes were collapsed, and their empty tunics lay in the cavity of the mouth, whilst the whole of the soft palate had been devoured by the larvæ, leaving the bones picked bare. Between three and four dozen larvæ were removed after the death of the toad. It was well known that toads and frogs were subject to such ravages, but until the present time no attempt to identify the larvæ had been successful. Dr. T. S. Cobbold had referred to the subject in the *Veterinarian* for 1880, but had been unable to name the maggots. Professor Brauer, of Vienna, had kindly examined the larvæ now exhibited, and had pronounced them to be of the genus "Calliphoræ." The species was indeterminate, but was probably *Erythro-cephala magna* or *Vomitina.* It was difficult to explain why the mouth and nostrils of batrachians were always the sole parts attacked. It was obviously impossible for the fly to lay its eggs directly in the toad's nostrils, and the probable explanation was that the eggs were laid in the toad's mouth, whilst a pregnant fly was being swallowed. It was stated that the number of toads had been greatly reduced by similar attacks of such larvæ.

In the discussion—Dr. Beaven Rake said that in tropical countries maggots in the nose and in the external auditory meatus were very common, especially in lepers, and also in persons in very different stations in life. He mentioned the case of a man who was stung by a fly, and later a large larva was expressed from a swelling which had formed at the spot.

There is a scheme on foot to extend the Royal Infirmary at Edinburgh so that it shall contain 200 additional beds. At a recent meeting of the subscribers it was referred to the manager for further consideration.

The following are the officers of the Odontological Society of Great Britain for the ensuing year:—*President*: J. Howard Mummery. *Vice-Presidents*: (resident) David Hepburn, T. H. G. Harding, R. H. Woodhouse; (non-resident) J. H. Redman (Brighton), R. T. Stack (Dublin), F. H. Balkwill (Plymouth). *Treasurer:* Thomas Arnold Rogers. *Librarian:* Ashley Gibbings. *Curator*: Storer Bennett.

Editor of Transactions: Walter Coffin. *Honorary Secretaries:* John Ackery (Council), W. A. Maggs (Society), F. Henri Weiss (for Foreign Correspondence). *Councillors:* (resident) W. Hern, F. Newland Pedley, C. J. Boyd Wallis, F. J. Bennett, Cornelius Robbins, E. G. Betts, Morton Smale, B. J. Bonnell, E. Lloyd Williams; (non-resident) W. B. Bacon (Tunbridge Wells), H. B. Mason (Exeter), Mordaunt A. de C. B. Stevens (Nice), T. S. Carter (Leeds), W. S. Woodburn (Glasgow), W. H. Williamson (Aberdeen); H. C. Quinby (Liverpool). D. W. Amoore (St. Leonard's), Wilson Hogue (Bournemouth).

ANY Member of the Odontological Society who grumbles at being bebarred from holding patents may take solace from the following remarks of Edison, published by the *Practitioner.* "Our patent system puts a premium on rascality. I have taken out 700 patents for my inventions, but I never had one moment's protection. The people suppose that I have made money out of my inventions. The truth is, I have never made one cent. All I have made has been out of manufacturing. The companies with which I am connected have spent millions in trying to defend the patents. I have spent about 600,000 dols. myself, and I believe that I would have been 600,000 dols. better off if I had never taken out a patent. What I have made is because I have understood the inventions better, and have been enabled to manipulate the manufacturing better than those who pirate the patents. I could not have made anything had I not had a large capital at the back of me, and the ordinary inventor gets no benefit whatever. His certificate of patent is merely a certificate of the poor-house, and hundreds of inventors are ruined. They spend all they have in getting out their inventions, and then they die poor and disappointed. Our patent system is a system of villainy."

The Dental Advertiser has changed its name, its editor and its make up. It is now called "*The Dental Practitioner and Advertiser.* It is edited by Dr. W. C. Barrett instead of Dr. Lewis, and its make up is certainly nice, only we wish it were stitched, its leaves have a most objectionable tendency to drop about.

THE *Cosmos* also appears in different form. The leads have been omitted between the lines, consequently they are closer together. Fancy goes a long way, but we fancy we like it better so, but opinions no doubt differ.

THE *Practitioner* publishes an interesting note by Dr. Miller on a recent death in Berlin, following a dental operation. "The Baroness Martha Von ——, engaged to be married to an officer of high rank in the German service, had a tooth filled. (Report does not say which tooth it was, but probably it was a lower molar). Soon after the operation pericementitis supervened, followed by great swelling of the lower part of the face and the neck. Laryngotomy was performed by Professor Schrötter, and every means employed to prevent the spread of the infection, but in vain. The young lady succumbed to the progress of the septicæmic condition, and died in fearful agony."

THE paper in our issue of December 15th, by Mr. Hopewell Smith was read before the Odontological Society, this should have been stated, but was by an error omitted.

Selection.

THE CROONIAN LECTURES.

On the Progress of Discovery Relating to the Origin and Nature of Infectious Diseases.

Delivered at the Royal College of Physicians, London.

By J. Burdon-Sanderson, M.D., Ed., F.R.S., &c.,
Professor of Physiology in the University of Oxford.

LECTURE III.

The purpose which I had in view in my last lecture was to show that, even in those instances in which the influence of microphytes in exciting processes of disease appears to be most direct, the proximate cause of the morbid action is always chemical. Our study of this subject brought before us the relation of the colourless corpuscles of the blood to the living and non-living causes of infection and in connexion therewith to the theory of Metchnikoff as to their protective function. As regards this theory it was shown that a remarkable antagonism exists between what might be called corpuscular activity as a sign of local inflammatory reaction and those infective agents which we have designed as phlogogenic, that intracellular incorporation is by no means the only resource which the organism possesses, and that just as the agents of phlogogenic infection are chemical, so it is by chemical means that they must be guarded against. We have to-day, in continuing our study of the struggle between the organism and disease, to pass from the phlogogenic to the specific infections, and with this view I must begin by asking your attention to certain terms which represent the two great divisions of the subject. These words are "mitigation" and "immunity."

Part. I. *Mitigation*—For the word "mitigation" (in German *Abschwachung*) the word "attenuation," borrowed from M. Pasteur, has come to be very generally used. There is no objection to it, provided it is remembered that what is designated is, as we shall see immediately, not what M. Pasteur originally meant by attenuation. For "insusceptibility" we have also taken to the use of the word "immunity," which is inconvenient, because the states to which we have most frequently to refer are neither states of immunity nor of the contrary, but somewhere between the two. What is chiefly important to bear in mind is, that the word "attenuation" relates to a variable quality of the *virus*, the word "immunity" to a variable quality of the infected *organism*. These two qualities are respectively virulence and susceptibility. They are closely related to each other, and the bond which links them is the relation between the growing power and toxic activity of the microphyte and the vitality of the organism. And inasmuch as these two are antagonistic, the relation between them is one of contest—*i.e.*, of struggle between organism and microphyte,—a contest in which preventive medicine strives to promote the victory of the organism either by strengthening its prophylactic power or by weakening the growing power of the microphyte. The first of these is accomplished when we confer on the organism diminished susceptibility or immunity; the second, when we deprive the microphyte of some of its virulence—*i..e*, we subject it to artificial conditions which mitigate it. In 1880 M. Pasteur not only discovered that the virus or contagium of certain communicable diseases can be mitigated by artificial means, but was able to demonstrate in the most triumphant way that the virus so mitigated can be applied to the protection of animals valuable to man. In this great discovery M. Pasteur took as his point of departure, not the infected organism, but the microphyte itself. He found that the micrococcus* which produces the so-called chicken cholera could, like the bacillus anthracis, be made to grow in bouillon, and the fresh cultures so obtained preserved their activity of growth and their morbific power for some time. But eventually the liquid, which was at first opalescent or even turbid from the number of "microbes" which it contained, became clearer and clearer. This process M. Pasteur called *attenuation*, recognising its resemblance to the change in fermenting liquors, to which that term has long been applied by brewers. He attributed it partly to the exhaustion of the nutrient material, partly to the accumulation in the liguid medium of products excreted by the microphytes contained in it. This, however, was not the main point of the discovery. The essential point was that *pari-passu* with the attenuation of the culture there was mitigation of its after-effect; for he found that whereas the fresh culture produces a characteristic disease which terminates fatally in twenty-four hours, a cultivation which has vegetated for several weeks gives rise to nothing more than a temporary disturbance of health. Pasteur further discovered that in animals inoculated with the mitigated virus of chicken cholera the micrococcus really multiplied in the body, which was thereby rendered so completely insusceptible that it could not be infected by any virus however active. The inference which M. Pasteur drew from his discovery of the attenuation of chicken cholera was that there is an intimate and essential relation between the virulence of a contagium and the vegetative vigour of the microphyte which produces it. The only way in which we can judge how far this is or is not the case is by the observation that the relation holds good by whatever means the attenuation—*i.e.*, the diminution of organic activity—is brought about. In M. Pasteur's experiment it seemed to be produced by mere exhaustion of the soil; but the same result has been since attained in a variety of ways, of which I must shortly describe the most important.

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* Duclaux: Le Microbe et la Maladie. (Paris, 1886, p. 157.)

One of the most generally applicable consists in cultivating the microphyte at a temperature which, although not incompatible with, is yet unfavourable to its growth. Applying this method to the bacillus anthracis, M. Pasteur found that the growth of this organism, vigorous at the temperature of the body, gradually diminishes in vigour as the temperature is raised to 42·5° C. (108° or 109° F.), and above this ceases. But in this case the most marked effect of the higher temperature is not attenuation, but diminished tendency to the formation of spores. Below 100° F. the constant habit of bacillus anthracis is to form spores wherever it has access to air or oxygen, at 109° F. it grows into a labyrinth of filaments, which, except that they form no spores, do not differ in appearance, or scarcely differ, from those grown at a lower temperature. To this change M. Pasteur also applied the term "attenuation," not meaning thereby that the filaments had undergone any diminution of size, but because he had found that a sporeless growth which has been cultivated for a length of time at 108° loses its disease producing powers more or less completely. At first it fails in infecting more refractory animals, but is still potent enough for the susceptible. Soon these cease to react, and a point is reached at which the culture can neither be used to start a new crop in the nutrient medium to which it is transferred, nor to communicate the disease. As I daresay everyone present remembers, these were the facts which led M. Pasteur to his great practical discovery—the use of attenuated virus for protective "vaccination." If the mitigated condition of the anthrax bacillus which I have described could be made permanent, if crop on crop of virus of any desired degree of mitigation could be produced, it would be possible at once to use it on a large scale for the purpose of rendering animals insusceptible. Guided by the purely biological conception that those characteristics of plants and animals which are transmitted from individual to individual *through the germ* are less subject to subsequent modification—that is, have more permanency—than those which result from the action of its environment on crops propagated by continuous vegetation, Pasteur, although no biologist, was led to anticipate that, having to do with a microphyte which is capable of propagating itself by spores, the most effectual way of accomplishing his purpose would be to act on it, rather in its spore-producing, than (as in his first experiment) in its vegetating form or condition ; and this he carried out by the simple expedient of transporting cultures which had been attenuated, as above described, by cultivation at 100° to another warm chamber in which the temperature was 98° F. At the lower temperature spores were produced which yielded crops of a permanently inferior degree of virulence.

A second method is that of Chauveau, which is based on the peculiar relation which exists between disease-producing microphytes—*i.e.*, microphytes capable of inhabiting the living tissues of man or of the higher animals—and the quantity of oxygen supplied to them—that is, the tension of free oxygen in the medium which they inhabit. Those which are *par excellence* anærophytes require the feeblest dose which can be imagined, and die if they have too much. Others, like the bacillus anthracis, grow differently, according to the supply afforded to them ; so that oxygen is clearly a powerful agent of modification. Even in the attenuation of the chicken cholera dumbbells M. Pasteur has shown that, in a certain sense, the determining cause of the modification is oxygen. For if this plant, which is an ærophyte, is freely exposed to air, with a limited supply of food, it vegetates vigorously, uses up its resources, and "attenuates" itself by exhaustion. Restrict both its supply of air and nutriment, it goes on growing at a vastly diminished rate, but (as M. Pasteur has shown) retains its virulence for an almost indefinite period. In this case the cause of the attenuation is exhaustion. Now it was long ago found by the late M. Paul Bert that bacillus anthracis, although it, as we have seen, rejoices in oxygen and produces spores most vigorously in free air, yet may have too much. It can actually be killed by subjecting it to an oxygen pressure of over thirteen atmospheres. Profiting by this discovery of Bert, and anticipating that if oxygen at high pressure kills, inferior pressure would "attenuate," M. Chauveau devised a method which, although technically more difficult to carry out than that of Pasteur, is quite as effectual in producing an attenuated virus. The difficulty was the mechanical one of constructing a cultivation chamber which could be charged with oxygen at any desired pressure. This surmounted, he was able at will, by the regulation of time and pressure, to bring about any desired degree of mitigation. In this way "vaccines" (in the peculiar sense in which this word is used by the Pasteur school) were obtained, which yielded what is called *immunite solide*, with this drawback only—that cultures attenuated by Chauveau's method are less permanently mitigated—*i.e.*, more capable of regaining virulence by cultivation under favourable conditions than those of Pasteur. A third mode of attenuation which has been successfully employed in M. Pasteur's laboratory may be distinguished as the chemical method, for it consists in adding to the medium an ingredient of which the unfavourable influence is not strong enough when used in extremely small percentage to arrest the growth of the microphyte, but is yet capable of impairing its activity. For this purpose either the organic bodies which are recognized as disinfectants have been used, or recourse has been had to metallic salts, particularly potassium bichromate, the use of which is alleged to have yielded mitigated cultures as permanent as those of either of the other methods. By a long succession of investigations by Pasteur and Chauveau it was proved that by such different methods as the action of an unsuitable temperature, a too abundant supply of oxygen, and finally the introduction into the nutrient medium of such a body as potassium bichromate, such a deterioration or mitigation of a virus can be produced as to fit it for the purposes of what M. Pasteur called a "vaccine." The fact that each of these methods has been used on a large scale for the protection of cattle from anthrax is one of great practical importance ; but irrespective of its utility it involves a fundamental principle relating to the etiology of infective diseases—namely, that there is an essential relation (though, as we shall see, a very complicated one) between the pathogenic property of a microphyte and its viability—between its vital activities and its power of producing disease. In the discussion of this subject we shall find that much obscurity has arisen from the confusion of the botantical (phytological) fact of attenuation with the pathological fact of mitigation. In all the researches relating to the subject which were published in France during the first half of the last decade, the two were assumed to be identical ; for the *prima facie* evidence of the connexion between vigour of growth on the one hand and virulence on the other was so strong and so striking that the cause came to be confounded with the effect. We shall have occasion as we proceed to see that it is not merely a logical necessity to separate the two ideas—attenuation and mitigation—in our minds, but that, in fact, the two qualities do not even vary in the same direction.

It is a remarkable fact that all the investigations to which I have hitherto referred were conducted in France. They were all made or inspired by one or other of the two great men whose names I have most frequently mentioned, Pasteur and Chauveau. I have now to ask you to cross the Rhine in order to learn how the critical mind of Germany has dealt with these brilliant discoveries. In Germany the Pasteurian doctrine that virulence varies in the same direction with vigour has not been accepted without limitations. German pathologists talk of "Abschwachung," but mean thereby not attenuation, but mitigation—*i.e*,, diminution of virulence not diminished vigour of growth. So far from attenuation being the necessary condition of mitigation, it is shown by Flügge* (one of the most accurate and acute of German bacteriologists) that as regards the less specific pathogenic microphytes it is just the contrary—viz., that the state of mitigation is not one of atrophy, but, on the contrary, of luxurious vegetation. There are some microphytes which, although they grow readily outside of the living body—*i.e.*, in nutrient media—in doing so, very rapidly lose their virulence. This appears to be the case, for example, with the chain-coccus of erysipelas, with the dumb-bell coccus of pneumonia, in both of which instances the microphyte, while doing the work of a saprophyte, grows vigorously, but loses the disease-producing power it before possessed. We can best conceive how this may be by attributing it to a sort of variability (in the Darwinian sense). We may suppose that the microphyte exists in two modifications: that in one it is capable of multiplying in the living body—*i.e.*, is virulent—that in the other it grows more luxuriantly in nutrient media, but is unadapted to the conditions which exist in the organism. Or we may suppose, with Flügge, that under all conditions there are two symbiotic forms of the microphyte, of which one gets the better when the medium is non-living, the other when the organism has to multiply as best it can in the living body. Guided by these considerations, we might, therefore, arrange pathogenic microphytes in a series, placing at one end those which grow vigorously as saprophytes, but are also capable of multiplying in the organism under favouring conditions, as, e.g., staphylococcus, and near the other the bacillus of tubercle, which grows readily in the organism, with difficulty in nutritive media, but is always virulent in proportion to its vitality and to its activity of growth.*

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* Flügge : Studien über die Abschwächung virulenter Bakterien. (Zeitsch. f. Hygiene, vol. iv., p. 208.)

In the next lecture we shall find that those microphytes which always display virulence in proportion to their vigour may be, in accordance with the accepted meaning of the term designated as specific—*i.e.*, that specific microphytes are those in respect of which attenuation and mitigation mean the same thing, whereas in the less specific virulence is a variable quality not necessarily associated with vigour of growth.

Part III. *Immunity.*—Every disease-producing microphyte must possess the power of multiplying under such conditions as prevail in the living body of man or other animals of similar organisation to man, and of causing therein poisonous products. It is this power which pathologists express by the term "virulence," which I must now try to define. The word may be used in a general way as the equivalent of morbific activity, but more strictly it means the relation between two sets of activities: those of the microphyte on the one hand, and those of the infected organism on the other, the influence by virtue of which the microphyte, with all its specific endowments, produces the morbid process. It is evident that this influence depends (1) on the power of the microphyte of growing in the living body; (2) on its power of developing chemical products which are toxic; and lastly, on the specific adaptation of the organism. It is to the last of these, under the term "susceptibility" and its contrary insusceptibility, or as it is now commonly called "immunity," that we have now to direct our attention. It is matter of common experience that although every disease-producing microphyte must possess the power of multiplying under conditions which prevail in the living body of man or of animals similar to man in organization, there is none which is equally virulent to all animals; or in other words, that to each microphyte different animals have different susceptibility. As this word stands, not for a positive quality of the organism but rather for the want of a power, which the animal body always possesses in very variable degree, of resisting or protecting itself from the invasion of contagio, it is in general more convenient to use a word which more expresses this protective power—viz, the word "immunity" —than one which suggests its absence. It is this *vis protectorix* which we have now to investigate; and with reference to it we have to enquire what conditions strengthen or weaken it when already possessed, and what produce or awaken it when absent. Anyone who considers what would happen if the golden cluster-coccus—the properties of which we had before us in a previous lecture—were allowed to spread in the organism without restraint is led to recognise that such a protective power must exist, and that in relation to the microphyte in question it must be exercised either in restraining its development or in destroying its vitality; and consequently that there must be something like a contest between the living body which is invaded and the invading enemy. To express this notion, which of late years has been present to many minds, the great botanist—whose loss we so lately had to deplore—Naegeli used, many years ago, the word "*concurrenzvorgang* comparing the battle between cells and microphytes with the struggle for existence between ferment organisms of different kinds in the same nutritive medium. The anology is suggestive, but too incomplete to be useful for what we have before us is not an encounter between opponents on an open arena, but an effort made by the organism as a whole to defend itself against invaders—to maintain its integrity and secure itself against attack. The contest theory, however, was of great value at the time it was promulgated; for when, twenty years ago, we first began to think of microphytes as causes of specific diseases, we were too apt to assume (and I willingly admit that I thought and said so myself) that all that was necessary for the production of a disease was the sowing of the seed, and that if once the fatal germ found entrance, it would certainly

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* In such a classification in line, bacillus anthracis would occupy an intermediate position. It grows vigorously both in dead nutritive media and in the living body. While much less constant pathogenically than the bacillus of tubercle, it is much more so than the streptococcus of erysipelas, but still admits of being permanently modified; for, as we have already seen, it is capable not only of vegetating, but of producing spores in a state of mitigated virulence. It is probable that the spore-producing mitigated cultivations obtained by Pasteur's method are also attenuated, for it was found by Chauveau that they had less power of resisting high temperatures (80 C.) than ordinary spores. As regards cultures which do not contain spores, it has been shown experimentally that "resistance," as measured by the dose disinfectant required to kill the bacilli, is a very accurate criterion of virulence.

> "Like pitted speck in garnered fruit
> Rotting inwards slowly, moulder all.

Whether the number of seeds sown were one or myriad, it was thought that, although the question of catching an infection was so far as an external conditions are concerned, a matter of chance, inside the infected organism it was simply a question of cultivation and vegetative multiplication; as if the contagium, instead of having to make its way against innumerable hostile influences, were as certain to develope in the living organism as it would be in a flask of bouillon. It is not surprising that, even after Naegeli and others had drawn attention to this mistake the importance of the defensive reaction of the organism was still underrated, for during the few years which immediately followed the splendid discoveries by which the *bacteriological* method of pathological research was brought into existence these discoveries so engrossed the attention of all that it was for a time forgotton that their real interest and importance lay in the better knowledge they afforded, not of the microbes as such, but as their disease producing power, and of the concomitant and subsequent changes which their penetration into the economy of man produces.

Now it is entirely different. The vast accumulation of exact knowledge which has been acquired as to the morphological characters and physiological endowments of microbes is valued not for its own sake, but because it enables us to understand the reactions which they evoke in the living body —reactions of which some are beneficial and protective, though they are called into existence by abnormal conditions; while others are of such a nature as to indicate that the defences of the organism have been forced, that the invaders are in possession, and that disease has begun. Our subject to day being immunity, it is with the first of these two classes of reactions exclusively that we have for the moment to concern ourselves. For what we mean by immunity is (as I shall endeavour to show as I go on) the power which the human or animal organism possesses of so resenting the presence of a disease producing microphytes as to protect itself from the diseasee.

We have already had before us in relation to the etiology of inflammation one of the explanations which has been given of the nature of this protective reaction, that which attributes it to the action of phagocytes. In its more special application to the question which occupies us to-day, it must, I think, be freely admitted that the general acceptance of the notion that protective reaction is the essence of immunity was very materially promoted by Metchnikoff's earlier publications, and by the experimental facts which he adduced therein, and that his more recent investigations have exercised a very remarkable influence in the same direction. But unfortunately we have to encounter phagocytosis, not as a result of experimental inquiry to be freely discussed on its merits, but a dogma which has acquired extraordinary popularity among the large class of persons outside of the profession who take an intelligent interest in pathological questions without possessing any acquaintance with pathology. In my last lecture I drew attention to the difficulty of supposing that in the spread of traumatic erysipelas the invading myriads of streptococci can be effectually opposed by the leucocytes which follow in their rear. A similar difficulty exists as regards the more specific infections. If phagocytes are to be looked upon as policemen, whose business it is to watch over the safety of the organism, they ought to present themselves in force where-ever and whenever there is danger. Now Metchnikoff's own observations, confirmed as well by his supporters as by his opponents, show that that is precisely what does *not* happen —*i.e.*, that although it is perfectly true that leucocytes take part in the local reaction to which the entrance into the organism of many pathogenic microbes gives rise, they are like policemen in this respect, that they neither appear at the place nor at the time that they are wanted; for if we compare the reaction which a mitigated culture produces in the subcutaneous tissue of a healthy animal with that which is evoked by a virulent one, we find that the main point of difference is that, whereas in the former case, where there is no danger, our policemen assemble in force, they are either entirely absent or appear in scanty numbers where danger is imminent. Now I am well aware how, if Dr. Metchnikoff were here he would explain this difficulty. He would say that the very fact of the absence of leucocytes is the reason why the microphyte is able to display its quality of virulence; that the toxical influence of very virulent microphytes is so intense that the leucocytes are promptly over-powered by it and unable to act; and in support of this explanation reference would be made to experiments which show that if the organism is "prepared" beforehand for the reception of the morbific microphyte by a previous localised poisoning, the result is the same as if the virulence of the microphyte were increased—*i.e.*, that under those conditions a mitigated culture acts as if it were virulent. I have had the opportunity of seeing the striking experiments which have been made on this subject by Dr. Rüffer, and fully appreciate their value and importance.

They afford conclusive evidence that an organism or part may be so weakened by the action on it by a poison that the power of protective reaction is abolished. But I think they fail to show either that protective reaction depends exclusively on leucocytes, or that, in swarming around bacilli derived from mitigated cultures, these corpuscles are actuated by a protective purpose. Even if we went so far as to admit leucocytes to be possessed of such a degree of consciousness as would enable them to judge of the degree of virulence of microphytes when in their immediate neighbourhood the advocates of the protective agency of phagocytes would still be in a difficulty from which so far as I can see there is no escape. The leucocyte which we meet with at a fogus of irritation have, we most of us believe, migrated from the blood vessels: but as we know, there are some people who hold to the old doctrine of proliferation or tissue germination. Let us admit that they may originate either way. If leucocytes are emigrants, the theory involves the monstrous notion that a leucocyte as it is being carried along by the blood stream, is so affected by the fact that virulent microphytes have been introduced into some part of the body, that of its own spontaneity it stops short, makes its way out into the normal tissue through normal bloodvessels, seizes on as many of the offenders as come within its reach, swallows and digests them, and returns whence it came. If they are not emigrants the difficulty which presents itself is quite as great for it must be supposed that the dissemination of virus from the focus of infection is intercepted by the agency of cells, which at the moment of invasion are as yet unborn, and which have to be brought into existence and activity to meet the emergency. If we turn from the general behaviour in the particular processes of disease in which their protective action has been regarded as most efficacious, we shall again find evidence of protective purpose on their part equally wanting. Ler us take the two examples of erysipelas and of relapsing fever.

(*To be concluded.*)

Abstracts of British & Foreign Journals.

INDUCTION OF LOCAL ANÆSTHESIA.

Corning (*N. Y. Med. Journ.*, December 29th, 1891) describes a method by which the peripheral nerve filaments may be bathed for an hour or more by a non-irritant and anæsthetic agent, the anæsthesia being thus maintained for a considerable time, and without mechanical aid. Thus, for instance, a solution of cocaine is injected, and then through the same syringe a non-irritant oil, such as cacao butter, made fluid by heat. A solidification of this oil is next produced by moderate cold, as, for instance, by a few whiffs of the ether spray, which latter must be repeated from time to time. As the melting point of cacao butter is from 86^0 to 95^0 F., a reduction through 15^0 to 20_0 F. is all that is required. The tissue remains of a milky-white colour so long as the solidification of the oil lasts, the capillary circulation being practically arrested. When the oil is allowed to melt it is absorbed without further trouble. The anæsthesia may be considerably prolonged by taking up a fold of skin outside the anæsthetic area, so as to overcome the excessive elasticity of the skin, and by maintaining this fold by plaster or otherwise. The author describes and figures a double-barrelled syringe with a single needle, designed for his method. *British Medical.*

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, December 7th, 1891. Mr. S. J. Hutchinson, M.R.C.S., L.DS., President in the Chair.

The minutes of the preceding meeting having been read and confirmed,

Messrs. Frederick Canton and J. F. Colyer were elected Auditors for the ensuing year.

Mr. H. B. Gill, of Upper Norwood, and Mr. Carl Schelling, of Blackheath, signed the Obligation Book and were duly admitted Members of the Society.

Mr. G. O. Whittaker, L.D.S., of King's Chambers, 26, King Street, Manchester, was balloted for and elected a Member of the Society.

The following gentlemen were nominated for Resident, Membership:—J. E. Harris, D.D.S. Mich. and D.D.S., M.S., Univ. of Maryland, U.S.A., 32, Queen Anne Street; J. Percy Smith, M.R.C.S., L.R.C.P., L.D.S., 26, Eaton Terrace, Eaton Square, S.W.; E. W. Roughton, M.D., B.S., Lond. F.R.C.S., 33, Westbourne Terrace, W.; Percy Edgelow, L.R.C.P.Ed., M.R.C.S. Eng., 7, Old Burlington Street; Michael Y. Woolfe, L.D.S., 1, Marlborough Place, St. John's Wood, N.W; W. H. Wheatley, L.D.S. Eng. and Glas., 14, St. James' Road, Victoria Park; and the following gentlemen were nominated for Non-resident Membership:—J. S. Amoore, L.D.S., 7, Abercrombie Place, Edinburgh; W. Palethorpe, L.D.S., 83, Edmund Road, Birmingham; E. T. Cooksey, L.D.S., 26, Marine Road, Worthing.

The PRESIDENT said that it now became his pleasing duty to announce that an old and honoured member of the profession had been recommended by the Council for election as an Honorary Member. To be in accord with their bye-laws, the recommendation of the Council should have been confirmed by an election, but when he mentioned the name of Mr. Thomas Underwood he felt sure that he might be allowed to abrogate the rule by asking them to accept him with acclamation

The announcement was received with hearty applause, and Mr. Underwood unanimously elected.

The CURATOR (Mr. STORER BENNETT), on being called upon, said that he had received two specimens; one, a three-fanged lower right wisdom tooth, sent by Mr. Jones, of Shrewsbury; the other, given by a student, viz., a crown of an upper bicuspid removed from a lady aged about twenty-eight, who had complained of some neuralgic pain. In the process of examination the point of a fine probe went into a small hole in the tooth, and with the slightest twist possible the crown came off; the crown was the merest shell, and contained a large pulp cavity. The gentleman who operated wished to extract the root, but the lady declined to have anything further done.

The PRESIDENT said that they were very much indebted for the donations. The last specimen was very interesting: the enamel was reduced as thin as a fine sheet of writing paper.

Mr. C. S. TOMES communicated a "Casual" on a case of "Purulent Discharge from both Parotid Glands." The patient, a lady, was attacked with typhus in about the year 1856 or 1857. During that attack she had inflammation of both glands, and since that time they had had a tendency to secrete pus. The only inconvenience that the patient suffered was that the mouth was rather dry and sticky. By squeezing the ducts one found that the power of starch conversion was still retained, and looking at the specimen of the secretions shown under the microscope, it was perfectly indistinguishable from normal pus. Mr. Tomes had examined the patient's face carefully, but could not find any trace of a scar. He did not know, and was unable to find a record, of any similar case. It was of over thirty years' duration. He should mention that Mr. Mummery had been kind enough to take photographs of it.

The PRESIDENT said that Mr. Tomes' case was one of extreme interest, and they were much indebted to him, as also to Mr. Mummery for the photographs. If any Member present knew of any similar case they would be glad to hear of it.

Mr. R. H. WOODHOUSE showed models of the superior maxillæ of two brothers, aged respectively thirteen and fourteen and a-half years. In this family there was a great congenital tendency to the absence of permanent lateral incisors

—a grandmother and two aunts, besides other relatives on the maternal side, never having had any erupted. In one of the models shown one lateral incisor was absent, in the other both lateral incisors were absent, and besides this a most unusual irregularity was seen, the canines on both sides being erupted between the bicuspids; the first bicuspids, therefore, being next in position to the central incisors. Mr. Woodhouse thought that probably the absence of the lateral incisors had allowed the first bicuspids to come forward, and the canines coming down subsequently had slid down behind them.

Mr. R. H. Woodhouse also brought before the Society a parallel action bracket that could be used either for working with gas or the electric light, a globe of water intervening to focus the light and cut off the heat. With gas an Argand burner was used with reflector behind, having a chimney, ten inches in height, to secure a steady flame. With electricity a sixteen or thirty-two candle power Edison lamp was used; the lamp-glass being ground to avoid any shadow being thrown by the filament. A concave reflector was placed at the back of this lamp; the lamp, which could be changed with perfect ease, being supported on an upright square rod, and secured in position by a thumbscrew, the whole working, if necessary, on a travelling horizontal bar. When not in use the glass globe could be removed, and bracket turned back out of the way.

Mr. W. H. Coffin asked if Mr. Woodhouse found no practical inconvenience from the fact that the light moved on a vertical straight rod, and must therefore move out of focus when raised or lowered.

Mr. Woodhouse replied that he found the focal area sufficiently large to make the inconvenience unappreciable.

Mr. Ashley Barrett showed models which he had taken a few days previously, representing the present condition of a girl operated upon twenty years ago for myeloid tumour on the left side of the lower jaw. That side was removed, and it was found that the right half had a tendency to be drawn in towards the median line. Mr Barrett endeavoured to overcome this tendency by a mechanical contrivance, but owing to the necessity of its being strictly in position both night and day, and the difficulty of attaining that end, it was not very successful. He also showed models of a somewhat similar case of myeloid tumour occurring in the mouth of a girl aged eighteen or nineteen. The year previous Mr. Mansell Moullin had removed the right half of the lower jaw. The girl asserted that she was unable to masticate freely, and he thought it was evident that the case was the same as in the previous case, viz., that the left half being drawn in towards the median line. Mr. Barrett was of an opinion that if she lived long enough her condition would be the same as in the case before narrated. He was very anxious to prevent this condition, but he did not quite see how it was to be done; he thought in the removal of the part of the jaw the operator had left as much of the periosteum as he could, but Mr. Barrett saw no evidence of new bone; the cicatrix was fibrous.

The PRESIDENT remarked that he felt sure similar cases must have come within the notice of Members of the Society, and it would be interesting to know if they had been successfully treated, and by what method.

Mr. HERN mentioned that three or four years ago one of his colleagues, Mr. Hulke, asked him to see a private patient for whom he had removed the right half of the lower jaw; the same tendency of the remaining half to be drawn in, which Mr. Barrett had spoken of, existed in this case. The patient was unable to antagonise her teeth. Mr. Hern made two plates completely covering the portion of the lower jaw and the teeth of the upper jaw, and drew the jaw back by elastic bands until he could almost antagonise, but not quite. He regretted to say that the patient had a recurrence of the disease for which she was operated upon, necessitating a further operation, under which she died, so that he was unable to say whether his contrivance would have been successful in bringing about the end he desired.

Mr. LAWRENCE READ said that he had a case somewhat similar under his care; the patient came over from Australia to be operated upon. There was an incision made on either side right up to the angle of the jaw; the operation was successful, and the patient then came to him. He made a case in vulcanite, enlarging it from time to time, and finally made a denture, with teeth on it, which, though it did not assist her in eating, prevented saliva coming from her mouth, and improved her appearance and comfort. He had heard since that it was a successful case, and now most of the mastication was done by the tongue, the power of which for such purposes was astonishing.

Mr. ASHLEY BARRETT was obliged to Mr. Hern for the information as to how he dealt with his case, but the difficulty seemed less in drawing back the ligaments than in keeping them there.

Mr. Frank Colyer showed a supernumerary tooth removed from the upper jaw in the region of the first molar. The root erupted first, and becoming slightly rounded off and darkened in the centre, was mistaken for a buccal root. The tooth was slightly tuberculated in character.

The President said that he had seen the tooth, and if any were sceptical they might see that it bore decided marks of attrition. He would remind them that a short time ago Mr. Smale showed a similar case of inverted canine.

Mr. Storer Bennett reminded the members of a specimen in the Museum of an inverted wisdom tooth; he had brought the tooth with him, thinking it might be interesting for them to see it in connection with this case.

Mr. H. L Albert narrated particulars of a case of ankylosis of the jaw remedied by operation, and exhibited the patient. He stated that in 1881 the patient had an acute attack of rheumatic fever, from which he had recovered, with the exception of a few rheumatic pains from which he had not been free since. About two years after the attack he awoke one morning and found his jaw completely locked —it was a definite case of bony ankylosis of the jaw. He was operated upon by Mr. Howes, who excised the condyle of the left side of the jaw and subsequently that of the right side, and about a month later removed about half an inch below the neck of the ramus. Two years ago the patient came to St. George's Hospital under the care of Mr. Albert's colleague, Mr. Bennett, who soon after decided to excise a wedge-shaped piece of bone just under the ramus. Eleven days later Mr. Bennett operated on the right side. After the operation the central part of the jaw dropped, and all power of swallowing was lost for a fortnight. The patient had regained the power, and had in fact regained the other movements of the jaw except the lateral. In view of a short discussion which took place earlier in the year when the severing of the ramus was recommended as a better operation than excising the condyle, he thought it might be interesting to bring forward this case.

Mr. C. J. Boyd Wallis said : As electricity is now coming into more general use, some convenient method of adapting the dynamic current to our several purposes is very desirable; with this in view he had designed the current resistance board then exhibited. A switch-board, consisting essentially of four sets of resistances, the first set having six carbons, and the other three sets five carbons to each, each carbon rod was placed in a glass tube, and had a resistance of about twenty-five ohms; the rods were capped with brass screw-pieces, by which they were coupled up for the various purposes indicated on the face plate, namely, a thirty-two candle-power lamp, a throat lamp, motor, mallet, cautery, and medical or induction coils. The thirty-two candle-power lamp acted a double purposes, namely, as a resistance to be used in series with the throat lamp, and as a powerful illuminating medium for special purposes. At the base was a set of 6 carbons, each of which was of fourteen ohms resistance, arranged as shunts to the other sets. The board was composed of a mahogany frame, a polished slate front upon which were placed the various sockets, the switch safety fuses, and terminals. The glass tubes containing the carbons were placed between thick sheets of asbestos board, and a clear ventilation ran right through the board.

The motor could be worked and regulated by means of the treadle, or independently of it by shifting the plug into the socket below, and bringing into play the use of the shunts, by means of which the motor could be worked at any speed, from a gentle revolution of the armature up to a speed of about 5,000 revolutions per minute. In his own house he had had a special wire laid on to lead current to the board independently of the leads for the house illumination; this he thonght a good plan, for the extra cost was trifling (in his case £2), and a good current was obtained, while the risk of interrupting the illuminating current was avoided.

He was indebted to Messrs. Miller and Woods, of Gray's Inn Road, for the very satisfactory way they had carried out his ideas.

He also exhibited some pure copper foil which is deposited by electricity, and then rolled to the required thickness suitable for filling purposes. In filling teeth with copper amalgam, and capping with a higher grade amalgam, the mercury generally percolates through the surface layer, and more or less discolours it. By lining the cavity with the copper foil, and then filling with a high grade amalgam the advantages of the copper are obtained without risk of discoloration to the amalgam.

Dr. Dudley Buxton exhibited an apparatus devised for carrying and administering nitrous oxide gas and ether in dental surgery. He said that it was very simple, and that there was little new in it, being an adaptation of an old principle. It would be convenient for using in those few cases in which it was advisable and allowable to administer what was spoken of as " a whiff of ether " in dental operations. It was an adaptation of Mr. Clover's apparatus, but so arranged that a minimum amount of ether was employed ; it was very portable and easy of manipulation, and consisted of a small ether reservoir holding half an ounce of gas, which was supplied by ordinary tubing and carried straight into the bag direct to the facepiece. When it was desired to have some ether, it was obtained by turning the centre milled nut in one direction so that the gas passed over the ether and became impregnated with it. Dr. Buxton said that, tried with an inhaler, experience would show that half an ounce would give enough anæsthesia, with very little smell of the anæsthetic and very little discomfort to the patient. The credit of making this ingenious apparatus was due to Mr. Ernest Mayer.

The President thought they were very much indebted to Dr. Buxton for bringing the apparatus, and allowing them to see how very portable and compact it was.

Mr. Lawrence Read wished to ask if the apparatus was intended for surgical or dental work, and whether it was intended that it should always be carried? He thought it was most undesirable that carrying ether and nitrous oxide should be made a practice of. Patients would in that way get something they did not think they were having, and under the impression that it was nitrous oxide gas would be liable to attribute any unpleasant symptoms which might be caused by the ether to nitrous oxide, which would obtain a discredit it did not deserve.

Dr. Dudley Buxton, in reply, said that he was exceedingly glad that Mr. Read had made the remarks which they had just listened to, because it allowed him to say what he otherwise should not have thought necessary. He entirely agreed with Mr. Read that the anæsthetic for dentists was nitrous oxide, but it had come within his experience that he was not infrequently asked by dentists to give gas and ether, and in these circumstances only would he employ it. He fully agreed that it would be most pernicious to give gas and ether surreptitiously, which would be practically acting a lie, but he did think that they were justified in giving ether in cases where prolonged operation was necessary. He did not think that it was desirable to give chloroform, and it was with the object to avoid this that the apparatus was designed; he had no idea of palming off either on the dentist or his patient a combination of nitrous oxide and ether as nitrous oxide only.

Mr. Ackery, referring to Mr. Woodhouse's remarks at the previous meeting, with reference to the limit of age to which temporary teeth had been retained, showed a right lower second deciduous molar, which he had removed in April of last year for a gentleman, then sixty-three years of age. The tooth presented marked erosion and calcification of the pulp and the adjoining permanent tooth. The first bicuspid was similarly worn. Mr. Ackery said this was the greatest age at which he had seen a deciduous tooth persistent, though others might have had more remarkable experience. The patient had, however, the left lower second deciduous molar still persistent, and as he was a robust man it was still open to him to create "a record."

Mr. Ackery also showed models of a case in which a woman, aged twenty-four, had six retained temporary teeth, viz., the right and left lower canines and right lower second molar, the right upper canine and left upper first and second molars. There were only six permanent teeth present, viz., right and left upper centrals and first molars, and lower right and left first bicuspids.

Mr. Ackery said that within his experience of the absence of permanent teeth it was extremely rare for the first molars to be absent (though in this case the history was not sufficiently clear to enable him to state that they had never been erupted). It was also remarkable in the present case that the lower first bicuspids were amongst the few permanent teeth *in situ*.

The President observed that Mr. Ackery seemed pecularly fortunate in getting cases of diminution of teeth.

Mr. L. Matheson, on behalf of Mr. G. Brunton, of Leeds, showed a mandrel for carrying emery discs, for which it was claimed that it was a compact and convenient form for carrying discs, so that the engine might be turned in either direction; the ordinary form of carrier admitted of the engine being turned only in one direction. He also showed new forms of enamel chisels, one for opening approximal cavities in the necessary region for the lingual service.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The Annual General Meeting of this Society was held on Friday, January 8th 1892, at 8 o'clock. R. Denison Pedley Esq., *President* in the chair.

The previous minutes of 1891, were read and confirmed.

The officers for the ensuing year were then elected, they were as follows :—

President. W. Robinson Humby, Esq., L.D.S., Eng.

Vice-Presidents. R. Denison Pedley, Esq., P. W. Greetham, Esq.

Council

Past Students. Messrs. Cutts, Arnold Prager, and Fripp.

Present Students. Messrs. Rowe, Mc. Farlane, and Barrett.

Hon. Treasurer and Secretary to Council. Reginald E. Bascombe, Esq.

Hon. Secretary to Society. Cecil Bascombe, Esq.

Hon. Librarian and Curator. Reginald E. Nicholls, Esq.

CASUAL COMMUNICATIONS.

Mr. HUMBY spoke of the age at which temporary molars were sometimes retained in the month, mentioning a patient he had lately seen, 51 years' of age, with the two lower second temporary and the upper left temporary molars in position. He said he would take models of the case if the President thought they would be useful.

Mr. SPOKES said he would like to know in which jaw temporary teeth are most commonly retained, he himself was inclined to think it was in the upper. He also asked, was it wise to remove temporary teeth after a certain age? because at present we had no means of knowing whether there were other teeth to occupy the position of those removed.

Mr. FRIPP said it was not uncommon to find temporary molars after the age of forty. He considered the second temporary lower molar was the most commonly retained, and most frequently in women.

The PRESIDENT said, as regards his own personal experience, both in children and old people, it was more common to find retained temporary teeth in the upper than the lower, jaw and he certainly considered that such teeth ought to be extracted, if their permanent successors shewed any signs of erupting. He also advised the removal of temporary teeth after a certain age on the score of overcrowding. He should be very pleased if Mr. Humby would take models of the case mentioned.

Mr. HUMBY then mentioned a couple of cases where he considered radical treatment was advisable.

The PRESIDENT then delivered his Valedictory Address.

After a vote of thanks had been passed, which was carried unanimously, the Annual Meeting adjourned until January 13th, 1893.

The next Ordinary Monthly Meeting will take place on Friday, February 5th, when Mr. Robinson Humby will give his Inaugural Address.

OBITUARY.

We regret to announce that Mr. George Claudius Ash, the eldest son of the late Claudius Ash, died on the 17th of January, in the 78th year of his age, at his residence in Maida Vele, London. He had not been well for the last twelve months, but the immediate cause of death was Influenza, from which he suffered only a few days.

Mr. G. C. Ash was first articled to the late Mr. Thomson, of George Street, Hanover Square, and afterwards practised as a dental surgeon for some time, but subsequently retired to join his father in the firm which has been so long known under the title of Claudius Ash & Sons. He was for a long time in charge of the manufacturing department of the firm, to which he devoted great care and attention.

As an employer, Mr. G. C. Ash was most highly respected, and life would be pleasant in every factory and workshop in England, if the same favourable conditions, which he always insisted upon, could be universally adopted. His services to his partners were invaluable, his life was a pattern to all who knew him, and he possessed a clear, calm judgment and ripe wisdom.

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ON EPITHELIOMA OF THE JAWS.*

By Christopher Heath, F.R.C.S.
Holme Professor of Clinical Surgery in, and Surgeon to, University College Hospital, Consulting Surgeon to the Dental Hospital of London.

Mr. Chairman and Gentlemen,—I had great pleasure in promising your President to give a paper here to-night, and I can only regret that the illness which is now so common should have laid him up, and prevented my having a colleague ot my own hospital in the chair.

Now, Sir, I thought I might say a few words on the subject of "Epithelioma of the Jaws." It is a subject in which I have for some time taken great interest, and I choose it because it has many things in common between the ordinary surgeon and the dental surgeon, for so many cases of epithelioma of the jaws begin about the gums.

We have two varieties of epithelioma affecting the jaws: the common form of squamous epithelioma, which occurs about the lip, face, and principally at the junction of the skin and mucous membrane, and the columnar form of epithelioma. It is only of late years that surgeons have recognised the latter form, e.g., columnar epithelioma of the intestines. We find that the columnar epithelioma development depends on whether the epithelium is originally columnar or not; where you have squamous epithelioma, and where you have columnar epithelium you will have columnar epithelioma. Now in the upper jaw there is the cavity of the antrum, where you get the best examples of columnar epithelioma; in the lower jaw we have no such cavity, and yet it is remarkable that the researches of Mr. Eve have shown that there is a condition of columnar epithelioma affecting the lower jaw.

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* A paper read before the Odontological Society of Great Britain.

Now, having got so far, let us go back to the squamous epithelioma. It is hypertrophy of the epithelium, with a tendency for the epithelium to heap up and burrow down in the deeper structures of the part ; and on the surface, wherever there is a squamous epithelioma, we have the characteristic heaping up on the edges, and the eversion of the edges, by which we recognise the disease. We have here (specimen shown) an example of the characteristic rough surfaces of epithelioma from hypertrophy of the epithelium, which would have gone on to ulceration if it had not been operated on.

Mr. Jonathan Hutchinson has shown that it is quite possible to " grog an epithelioma," to use his own language ; that is to say, if sufficient irritation of the parts subject to this disease is kept up, it will undoubtedly produce an epithelioma. Now the best example I know is the classical one of epithelioma of the lower lip. You may see cases of men, and almost invariably men—if a woman suffers it may be taken that she is a smoker addicted to a short clay—having an ulcer on the lip, which in time produces an epithelioma, due to the constant use of a dirty pipe. Another example is the irritation caused by the teeth. I suppose we surgeons see more cases of epithelioma of the tongue due to the irritation of the sharp, ragged edges of the teeth than any other cause ; in fact it is at the side of the tongue that epithelioma of the tongue usually developes. To come to your own special department if you have a denture which does not fit, and is constantly keeping up irritation, and particularly if it is never taken out of the mouth, ulceration is set up, and by irritation developes into an epithelioma. Now these cases of epithelioma of the gum are pretty characteristic and well marked, and should be recognised at once by their everted edges and excessive painfulness. There is this also to be borne in mind, that the disease dips down into the deeper structures—and this is the very danger, dipping into the gum and so invading the alveolus.

This has an important bearing on treatment. We all know how a surgeon desires to avoid breaking the line of the jaw. I do not know a case in which the chin did not go round. I have seen in your own journal cases mentioned where, by some clever mechanical contrivance, the chin has been brought straight, but in my own experience I have found any such method so extremely painful to the patient as to render it impossible of adoption ; the muscles on each side begin to contract, and so force the jaw out of place. The point of practice which I want to insist upon is this, that if there is a real epithelioma it is of no use to spare the jaw; if you do so, if you divide and then clip away the alveolus, you will have a recurrence. I believe the right thing is to saw out the piece ; anything less in my opinion will rarely prevent recurrence. That of course applies to both jaws.

We have, of course, in the upper jaw the disease spreading up along the palate and into the antrum, and frequently further than the antrum. Here is a specimen (shown) of the last case I operated upon, and I want to call attention to the disease being principally on the palate, and spreading from that into the antrum. The man, a soldier, is aged forty-six, and he suffered from this for some time. There were several masses of cancer, both on the hard and soft palates, but no involvement of the orbit ; the disease was entirely confined to the cavity of the antrum. I learnt, rather to my surprise, that an operation had been refused on what ground I do not quite know. I went very carefully into the case, but could see no reason why it should not be operated upon, and accordingly operated. I had my reward, for I got into the greatest difficulty I ever had in my life, but not in connection with the operation itself. Dr. Dudley Buxton had given the chloroform in his usual skilful manner. There was nothing special about the incision through the skin, but in the midst of the operation, we suddenly found that the patient had ceased to breathe. We pulled out his tongue, and used every effort to restore breathing, but without result. I at once performed laryngotomy, and sucked out his windpipe ; still no breathing. I then took a pair of forceps, and removed the largest blood clot I ever saw removed from the windpipe : breathing was restored, and I finished the operation. The patient, you will see, has made a very good recovery. You will also notice that the operation was done through a very limited incision from the corner of the left eye. You will observe how very much the disease extends along the palate ; more than I have ever seen before. One can easily take away the upper jaw, but I had to take a considerable portion of the soft palate, not quite down to the uvula. So much, then, for a good example of epithelioma spreading from the gums and palate through the antrum, and it might have gone still further if left.

Now to contrast with that a case of columnar epithelioma. I am sorry that, owing to an accident, I cannot show you the specimen which is in the College of Surgeons' Museum, but it shows extremely well that the disease was entirely confined to the upper jaw. It occurred in a gentleman aged sixty, who first knew that anything was wrong by a discharge from the nose. I don't know whether you are aware that nose-surgery is very much in the ascendant just now—indeed, I should say that there are almost as many nose-surgeons as there are noses; the wonder is that we have any noses left. This gentleman was treated for discharge from the nose, and then treated by his medical man for gum-boil. I went carefully into the case, and I felt sure from the general appearance and the history together, that there was very much more serious mischief behind, and that is often the case with supposed polypi, &c. I explained the nature of the case to the patient, and got his permission to remove the upper jaw. I congratulated myself on the fact that the whole exterior of the maxilla was healthy, but on making a horizontal section, you will see that the whole of the antrum is filled up with a beautiful specimen of columnar epithelioma, which had pushed its way into the nose. I am particularly sorry that your President, Mr. Hutchinson, is not here, as he fitted the patient up with artificial teeth, but scarcely had this been done when the disease sprang up in the cavities behind the jaw, and eventually destroyed the patient.

Another gentleman came to me lately—all the way from New Zealand—with an ulcer of the skin, and the letter I got said that he had had an operation done out there for this ulcer, but it seemed to involve the bone. Well, I found on examining him that not only was there an ulcer, but that the sub-maxillary gland was enlarged, and there was a distinct growth on the lower jaw. I told him that it was a very serious case, and operated upon him. Now there was nothing special in that, but the point I wish to show you is that the disease did not merely crop up and involve the periosteum of the lower jaw, but that it had gone right into the interior of the lower jaw, and spread between the teeth. I mention it to illustrate the point that you may have epithelioma from above invading the bone, and in either case I do not think you can make too free in removing it.

Then again, you may have epithelioma of the lower jaw following epithelioma of the lip. Now epithelioma of the lip is one of the least active forms of epithelioma, and it is remarkable that after it is thoroughly cut out it rarely recurs, and when it does, it does not recur in the position of the original disease. In this case (portrait shown) you will notice the scar in the lip on the right side of a soldier under thirty. Two years ago he had an epithelioma cut out of the lip by an army surgeon, and very well done it was; he was quite well for eighteen months, and then seemed to have trouble about his chin. I was written to about the man, who said that he had a carbuncle, and that it had been poulticed, which certainly ought not to have been done. It was a well-marked example of epithelioma, the result of a secondary deposit after the removal of the disease from the lip. Now it involved not only the chin, but also the glands; I was able to remove it by an extensive operation, taking away the whole of the front of the lower jaw, including the bicuspid teeth. The whole of the disease is in front, and nothing less than this operation would have been of any service. I have tried years ago in a case of this kind to saw off the bone without opening the mouth, and it looked exceedingly nice for a time; the man was apparently well, but in a year from that time the disease recurred. Now this man is here, and you will see what remarkable coming together of the portions of jaw there is. united by fibrous tissue; I will not say ankylosed. I do not see how this condition is to be prevented. If wedges were put in, the parts would not heal, and moreover, I do not see how the patient could bear it. On one occasion I had an apparatus made, but the patient was not able to endure it.

There is still a third class of case, viz., in connection with the tongue. Not uncommonly we see a development under the tongue, and here the specimen shows a large ragged ulcer in the tongue involving the lower jaw; in such a case as that I do not see that anything can be done except to remove the central portion of the jaw. I need hardly say that it is a serious operation. I have a specimen here, which has been rather spoilt in the cleaning, but which was a most remarkable specimen of extensive epithelioma. The man got epithelioma of the front of the tongue, which was connected with the lower jaw, and infiltrated its tissues. It was one of those desperate cases in which one hesitates to do anything, but the man was in such pain, especially about the occiput, that I divided the jaw, and I put an *ecraseur* on, and took away the whole of the tissues beneath the tongue. It was very like the specimen going round, but it was done in a different way. The man made a perfect recovery, and I have seen him from time to time. He turned up last year, and I believe he is still alive, sixteen years after the operation, and so well that one is inclined to think, was it a case of epithelioma ? but I have no doubt about it. Here is a case of a similar epithelioma which involved the jaw, originating in the lip. For this man I removed the lower jaw, but unfortunately he had a recurrence of the disease.

I think, Sir, the principal points that I would venture to bring before you are the necessity for recognising the fact that any irritation may in time produce squamous epithelioma, which when once developed goes much deeper than we should at first suppose. It is most important that any operation should entirely remove it, and not merely cut into the growth. Anything of that kind simply increases the irritation. With regard to the columnar epithelioma, which is not so common and not so frequently recognised in the upper jaw, I think it will be recognised more as men are more alive to it, and bear in mind the fact that what appears to be disease of the nose is very often not disease of the nose at all, but disease of the antrum.

VALEDICTORY ADDRESS.*

By Mr. HUTCHINSON, M.R.C.S., L.D.S.

The time has now come when I must say a few words of farewell on leaving the presidential chair of this Society, and I feel that my first duty must be to offer a few words of hearty personal thanks, to the members of the Council and of the Society, who have so largely contributed to the success of our meetings, and by their kind support have rendered my year of office one of great pleasure, and have lightened the burden of my great responsibility.

The Council meetings have been largely attended, and it is only right to acknowledge what an enormous power this gives to a President, in the discharge of his duties, for him to feel that he can lay every question of doubt and difficulty before a strong Council, and thus get a vote representing the spirit and tone of the Society.

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* Delivered before the Odontological Society of Great Britain.

I feel so strongly in this matter that I must be allowed to thank individually the various officers of the Council who have, one and all, worked with a will to carry us through a year of considerable difficulty and responsibility. Our treasurer, Mr. T. A. Rogers, has been a tower of strength, for his long association with our Society, his loyal conservation of its best traditions, and his unfailing good judgment have indeed been most helpful. Then again, the success which attended our conversazione to the British Dental Association was, in great measure, due to Mr. Ackery's unceasing energy and clever management.

I think we may justly feel satisfied with the numbers who came to the reception in spite of the inclement weather which prevailed, and which, no doubt, kept away many who would otherwise have been present.

In mentioning Mr. Ackery's name, it is only right to add those of Mr. Maggs and Mr. Henri Weiss, who have each spared no pains to fulfil their duties, and I think the ample supply of papers and of interesting casual communications is the strongest evidence of the thanks we owe to Mr. Maggs.

This past year has been marked by two important events, one of which is the fact that our Curator, Mr. Bennett, has completed the supplementary catalogue of the Museum, from 1884 up to the present time. Every specimen in the Museum is classified and numbered, but many numbered specimens are stored away in drawers and cupboards, awaiting the future re-arrangement, or actual moving of the Museum.

The other important event is the editing and arranging the "resolutions of Council," so as to be capable of ready reference by the Council in its deliberations. Few of us can realise what the labours of the sub-committee have been, and our grateful thanks are due to Mr. Coffin, Mr. Gibbons, Mr. Bennett, Mr. Stocken, and the two Honorary Secretaries, for the unremitting labour they have spent on this most useful work.

I am told, upon inquiry, that they have held no fewer than thirty-five meetings, lasting often from two to three hours.

This work was first undertaken by Mr. Rogers and Mr. Coleman, who published the first instalment in the year 1871, and the present sub-committee have, during the past year, continued the work up to date.

The past year is notable, too, for the number of nominations of new members—in fact there are twenty-two before the Council now, which is very satisfactory and encouraging. I always say that there are three things which a man should do as soon as he takes his dental diploma: first, to register: secondly, to join the Odontological Society; and thirdly, to join the British Dental Association and subscribe to its Benevolent Fund!

Now, Gentlemen, I think we may look back with satisfaction on the work that has been done by our Society in the way of papers; for I think we have had one upon nearly every branch of our art. In February Dr. Arkövy dealt with the latest methods of contour and crown-work. Dr. Silk gave us a most interesting and valuable paper on "Bromide of Ethyl in Dental Surgery," in which he proved, very much to our satisfaction, that the strong faith, expressed in my inaugural address, in the value of nitrous oxide in the first rank as an anæsthetic for dental purposes.

Dr. Job Collins read a most entertaining and useful paper on associated and related ocular and dental diseases, in which he effectually destroyed some of our pleasantest and most cherished illusions!

Mr. Pearce Gould added to our store of knowledge by his valuable paper on a fatal case of impacted tooth-plate.

These papers by physicians and surgeons bore strongly on our subject, but the remainder of the session was occupied by papers of a more purely dental nature, and we have to thank Mr. Douglas Caush for a capital account of exostosis, illustrated by some beautiful sections shown by the projection-lantern.

Then Mr. Balkwill, of Plymouth, sent a short paper, the result of much research, on morphological dental irregularities, and it is to be hoped that Mr. Balkwill may be able to add to and extend these interesting cases.

Mr. Sewill furnished a paper verifying Dr. Miller's researches in the artificial production of dental caries, also illustrated by the lantern.

A very instructive paper, the result of earnest work, was contributed by Mr. Hopewell Smith, on a method of preparing sections of teeth and bone to show hard and soft parts in combination. This was a very successful demonstration, and will, no doubt, lead the way to many useful discoveries.

Then in December we had an original and interesting communication from Mr. Hooton, of Manchester, on his invention of a method of moulding continuous gum to any case, by means of set matrices, as easily as vulcanite.

And finally at this meeting we have the welcome presence of Mr. Christopher Heath, so well known for his classical work on "Diseases of the Jaws," and above all for the warm interest he has always taken in dental matters, as testified by his position as Examiner on the Dental Board, and as Consulting Surgeon to the Dental Hospital of London; and he has, on more than one occasion before, given this Society the pleasure of welcoming him as a contributor to its archives, as we do once more to-night.

This, gentlemen, forms a good record for the session, and it has also been enlivened by many very valuable contributions to dental surgery in the way of casual communications, and we have had a good deal of light thrown upon the electric lighting of our operating rooms.

I have now dealt with the work we have done; let me now turn to the things we have left undone, and I must refer to my address of last Februrary.

I spoke of the possibility of our Society being called the "Royal Odontological Society," but in the uncertainty as to our future habitation it did not seem opportune to move in the matter at present.

I spoke of the day when every qualified dental surgeon would regard membership of this Society as a higher diploma, but I never said it could be regarded as a qualification—in fact I look upon it very much as I look upon the R.A., or the R.W.S., or the R.I. for artists, but for us the L.D.S. is the qualifying diploma.

Whilst I am on the question of titles, I should like to say one word upon a very important question, and that is the decision of the Lord Chief Justice and other judges on the use of the title, "Doctor" by qualified medical practitioners.

I am not going to enter into a disquisition on the subject, but I merely wish to say that I hope the day is not far distant when the same law shall be applied to dental practitioners who style themseves "Doctor," when they do not possess a registrable medical degree.

Our ranks have been thinned this last year, both by death and by resignations, and we have amongst others to mourn the loss of a very distinguished honorary member, Professor Wedl, who died in 1891, and of a past-president, the much-lamented Samuel Cartwright.

During the past year your Council has been much occupied with the question of finding new quarters, on account of the notice to leave given us by the Dental Hospital last May, and here again the Hon. Secretaries, and especially Mr. Ackery, have devoted much time, and trouble, in the search for suitable accommodation. That we have arrived at no definite decision to lay before you, is due to the fact that in December we received unofficial information that the Dental Hospital saw its way to extend its borders, so that for some time at least, we need not seek a fresh abode. But these negotiations are still in abeyance, and we are uncertain as to the future.

It is well to mention that, amongst other schemes, we applied to a famous scientific society to be allowed to share its rooms, and we received a very favourable answer as far as our meetings and our library were concerned, but there would have been no room for our museum.

The Council has had almost endless plans laid before it, and discussed them, but it is useless to take up the time of the meeting now, as they will have to be considered on a future occasion.

I have only to express my earnest hope that some plan may eventually be found, so that the Odontological Society may not have to leave the Dental Hospital of London, and that means may he found to secure a building which shall be amply large enough to hold the Odontological Society, the British Dental Association, and the Metropolitan Branch, with museums and library, under the roof of the Dental Hospital, but at the same time *distinct* from the *hospital* portion of the building, and accessible to all members, and to students of other hospitals.

I am glad to think that my successor in this chair will be one who has done so much good scientific work, and I feel sure that a large measure of success will attend Mr. Mummery's year of office.

Now, gentlemen, in bidding you adieu, I must again offer my sincere thanks for all the kindness I have received, and for the forbearance you have shown to my short-comings.

All through my year of office I have been impressed by a strong sense of the importance and of the power of this Society, and I can only conclude with a heartfelt wish for its continued prosperity and success!

GENERAL ANÆSTHETICS IN DENTAL SURGERY.*

By F. L. Tanner.

(*Concluded from page* 106).

Administration. Having everything ready to begin operating, including the forceps required, the patient should be seated comfortably in the chair, with the head only slightly inclined backwards, as, if the front of the neck is put on the stretch, it is difficult for the patient to close the glottis should any blood or saliva require to be swallowed. Now place the gag securely.

Before applying the face-piece it is a good plan to demonstrate to the patient how you wish her to breathe. The inspirations should be deep and deliberate. Now apply the face-piece, and see that it is carefully adjusted so that no gas can escape, it should then be held in position with one hand, leaving the other entirely free. For the first two or three inspirations allow the patient to breathe pure air only then, at the end of an expiration, turn on the stopcock so as to admit a full flow of gas. Absolute silence should now be maintained for, as pointed out by Mr. Braine, at a certain stage the sense of hearing becomes morbidly acute. Particularly avoid speaking about either the patient or the operation. Any admixture of air with the gas should be avoided, not because it causes excitement, but because it weakens the effect of the gas.

After the first few inspirations, slight pressure on the bag is an advantage, as the more quickly the patient is anæsthetised, the more successful. it seems to be.

No absolute rule can be laid down as to when to cease the administration of the gas. Experience alone will teach this. The slow regular respirations which immediately succeeds the rapid breathing of the earliest stage, is a sign that the anæsthesia is nearly complete ; and immediately a slight tremor or twitching will probably appear ; this is soon followed by signs of laryngeal stertor. A sufficient degree of anæsthesia has now been produced for the commencement of most small operations, as the extraction of one or two easy teeth or loose roots ; should however the operation be likely to last longer, a few more inspirations of the gas may be allowed with perfect safety. The respiration now becomes markedly stertorous and slightly intermittent; convulsive twitchings extend to the arms and legs, amounting almost to jactitations ; and if the gas be still pressed tonic spasm sets in. The pulse is now distinctly intermittent. Beyond this it is dangerous to proceed, and, in the majority of cases, it is not advisable to proceed further than the development of true stertor, as the very trifling prolongation of the anæsthesia obtained is more than counteracted by the trouble in restraining the movements of a spasmodic patient.

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* A Paper read before Students' Society, Victoria Dental Hospital, Manchester.

Dilatation of the pupil and the abolition of the conjunctival reflex are too uncertain to be relied upon as signs of anæsthesia.

While we must be careful not to overdose the patient, the operation should never be commenced till the anaesthesia is complete, nor continued after the effects have begun to fade, as during incomplete anæsthesia, a slight shock may arrest the heart's action, which without the anæsthetic would have had little effect. Also, apart from this danger, it destroys the confidence of the patient both in you and the anæsthetic.

It is a good plan to invariably place one hand over the patients eyes immediately the operation is concluded, as, if light is excluded, they come round more gradually and quietly With this exception they should be left undisturbed till consciousness is complete, the gag being also left *in situ*, since, if it is removed while the patient is in a semi-conscious state, he may think that another tooth is being extracted.

Nervous persons, who insist upon holding their breath or commence to struggle and pull away the face-piece, are common sources o trouble to the administrator. In the majority of cases a little kindly reassurance will probably suffice, but in a few cases especially children this will have no effect, and the inhalation will have to be forced in spite of struggles.

Occasionally very excitable and hysterical girls and women commence to scream and kick just as they are passing fully under the influence of the gas. They should not be restrained as the movements are entirely reflex, but the pressure on the bag should be increased and the inhalation forced. It is impossible within the limits of a paper to refer to all the troubles and variations in phenomena met with, and I must now pass on to a brief consideration of the accidents.

Accidents. There are so far only 11 authentic cases of death on record following the administration of Nitrous Oxide, out of the many hundreds of thousands of individuals to whom it has been administered, and in not one of these was death directly due to the gas.

Death has invariably resulted from one of two causes, either asphyxia or syncope, it has never been due to sudden paralysis of the heart. In most of the cases where asphyxia was the immediate cause, either carelessness, or an accident has been found to be the remote cause.

Three of the cases occurred in 1864 and were probably due to impurities in the gas. Of the other eight cases we have only a reliable account of 6. Of these 5 were probably due to asphyxia. In one case a cork lodged in the larynx; in Mr. Mason's case probably a portion of the gag was bitten off and entered the larynx; in Mr. Williams' case it was probably due to the tongue slipping backwards, though in this case at the inquest the cause was returned as failure of the heart's action, still this was strongly disputed at the time. In the case at the London Dental Hospital the man was suffering from extensive cancer of the tongue, which probably embarrassed respiration.

In the Edinburgh case the lady's corsets were so tight that after death they had to be cut off her.

Only one case can fairly be attributed to syncope, and that occurred when only one or two inspirations had been taken, and after considerable struggling. The *Lancet* commenting on this case said "The Nitrous Oxide could have had no more to do with the fatal issue, either directly or indirectly, than if it had never been brought into the room. The patient manifestly fainted from terror, and if Mr. Newbrough had only laid her flat on the floor, she would probably have recovered in 5 minutes, have paid him his fee, and have walked away from West Thirty-fourth street as well as she entered it. It was the unwisely holding her upright that determined the fatal issue."

On looking over the evidence given at the inquests held in these cases, we can hardly fail to be struck by one or two facts.

In the first place all the deaths have occurred in the hands of dentists, and though this is probably accounted for by the fact that it is mostly used in dental practice, still I think it ought to have the effect of making us employ the greatest care in its administration.

Then in nearly every case the patient was left sitting in the chair while the attempts at restoration were made. Now it cannot be denied that syncope is much more likely to occur in the upright than in the recumbent position, and the remarks which I have read you from the *Lancet* very forcibly show the folly of such a proceedure.

In one or two cases we find that the administrator failing to restore consciousness in a few minutes left the patient and went to seek for further help. Now, gentlemen, I maintain that if he knows what means ought to be adopted his place is at the patient's side, and the attendance of a dozen medical men can be of no service; besides which the few minutes thus lost will probably decide the patient's fate.

Then the Edinburgh case brings very forcibly home to us the necessity for assuring ourselves that the patients breathing is not impeded.

It has been proved beyond doubt that the heart continues to beat several minutes after the movements of respiration cease. Hence the rule in administering is, to watch the patient's breathing primarily, and the pulse only as a secondary precaution. If we trust entirely to the pulse the first intimation of danger will be the death of the patient. Should the patient not appear to be breathing satisfactorily, immediately pull forward the tongue, and, if certain that no foreign body has slipped backwards, compel the patient to take a full deep inspiration by forcibly compressing the chest or thrusting the fingers as far back in the mouth as possible. Pressure is best applied to the lower end of the sternum, for the resilence of the thoracic walls is there greatest.

In the majority of cases the result will be an immediate deep inspiration. Should however this not occur, immediately apply nitrite of amyl and lay the patient flat on his back, or even with his feet a little higher than his head. In the majority of modern operating chairs this can be accomplished with little trouble and without removing the patient from the chair.

Should even this not have the desired effect, there is no time to be lost; the patient must immediately be removed from the chair and laid on his back on the floor, his shoulders well raised with anything handy, and his head thrown well back and artificial respiration kept up for an hour at least, so that the tide of oxygen to and fro may be maintained until the natural chest movements revive.

Three methods have been proposed for carrying this out, Sylvester's, Howard's, and Marshall Hall's. Of these the first is the simplest and probably the most effectual.

Everyone who undertakes to administer an anæsthetic should be able to perform this simple operation. Briefly the process is this :—Having placed the patient as already described, draw forward his tongue and secure it by an elastic band or piece of tape or string passing over the tongue and under the chin.

Standing at the patient's head, grasp his arms just below the elbows, and draw them gently and steadily upwards above the head, then pause. Air is thus drawn into the lungs. Then turn down the patient's arms and press them firmly against the sides of the chest. Air is thus forcibly expelled from the lungs. Repeat this slowly and deliberately.

The most general mistake in carrying this out is, in the excitement to make the movements too rapidly and irregularly It should not be repeated more than from 15 to 20 times per minute.

In addition to this plenty of fresh air must be admitted, and cold and warm water may be applied alternately to the face and chest. Dashing cold water on the chest is likely to do more harm than good before there are some signs of returning natural respiration.

A galvanic battery if at hand may be employed, applying the positive pole to the back of the neck, and the negative to to the end of the sternum, and breaking and renewing the current about 15 times per minute. As soon as the patient can swallow, administer brandy or a little Sp. Ammon. Aromat (Salvolatile).

Should, however, we have some suspicion that a stray tooth or gag or other foreign body has slipped backwards, and is in danger of slipping into the larynx, draw the patients head well forward, and attempt to dislodge it. Should this be impossible and it not be coughed up, inversion must be tried. Should even this fail and death from asphyxia seem imminent laryngotomy is the only recourse.

I have already taken up so much time gentlemen in the consideration of nitrous oxide that I cannot do more than refor very briefly to two of the other anæsthetics most commonly employed, chloroform and ether.

Ether.—Where a slightly longer time is required (1 to 2 minutes) for the operation than can be obtained with nitrous oxide alone, a little ether given subsequently to the gas will often be quite sufficient.

In the administration of ether 2 distinct stages of anæsthesia are produced in which operations can be performed; one transient, and which occurs before the onset of struggling takes place, and yet is sufficiently long for the performance of a dental operation. To produce this effect nitrous oxide should first be administered, and as soon as the first symptoms of anæsthesia appear 3 to 10 breaths of ether vapour added to the nitrous oxide. This is the only stage which the dentist should attempt to produce without the presence of a medical man. Dr. Hewitt says that if not more than the amount ether recommended be employed the recovery is almost, if not quite as satisfactory as when nitrous oxide alone is employed It is very rare for nausea or headache to follow its use, and if they should they are only very transient. Mr. Wilson thinks that the employment of a small quantity of ether is less likely to upset the patient than giving gas several times.

It is always advisable to inform the patient, after the administration that it was necessary to add a small quantity of ether vapour to the gas.

The second stage is that of true etherisation, and which comes on after struggling. This is the stage necessary for more prolonged operations.

Dr. Hewitt's apparatus will be found the most convenient, but for a detailed account of its employment, I must refer you to Dr. Hewitt's little work on "Nitrous Oxide and Ether."

The use of *Chloroform* should be restricted to those cases in which neither nitrous oxide or ether alone or combined are advisable, for notwithstanding the results of the two Hyderabad Commissions the fact remains that the employment of chloroform is far too frequently attended by death to justify its employment as a routine anæsthetic in dental practice, particularly as the danger is necessarily increased by the more or less upright position of the patient.

To administer chloroform as a matter of routine in dental practice is to violate all laws of proportion between the peril of the operation and that of the anæsthetic, and though the dentist will not as a rule decide for himself what anæsthetic shall be employed, he should invariably refuse to operate with chloroform, unless he is satisfied that its use is really necessary.

In dealing with such a large subject gentlemen I have only been able to present to you a few of the more important facts and methods, but I think that these are the ones which will be found most useful in everyday practice.

BEANS OR PEAS.

By Appleby King, L.D.S.I.

A patient was sent to me by a medical man for the purpose of making an examination of his mouth, the object being to discover any cause of severe pains he had been suffering from, and as he said "giving him beans." He complained of sickness, and pains in the intestines. The doctor suspected that probably some copper filling might be the cause of some irritant poison, he being unable to account for it in any other way. I could find nothing that tended to support the suspicion of the doctor. There were several amalgam fillings, (not copper), and one large cavity that had never been filled, this he asked me to attend to. On excavating the cavity, among other matter removed, was a perfectly green pea. The mystery was at once solved. I then said, "Now before you felt this attack of sickness and pain of which you complain, did you partake of some entreé served with green peas out of season?" The reply was, "Yes, but how on earth could you know this?" Handing him the green pea which was as well preserved as if it had been in the tin can, I said "here is one of them just removed from the cavity of your tooth, which explains the whole thing. Take my advice, eat no more green peas out of season. This delicacy is prepared in France and imported for the English market, well charged with copper to give them a good colour, and are so poisonous that the French government have forbidden their use in France, but do not think them too nasty for Englishmen like you; you are mistaken, it is peas you have been suffering from, not 'beans.'"

British Journal of Dental Science.

LONDON, FEBRUARY 15th, 1892.

NOTES ON CHLOROFORM.

The number of deaths from chloroform, lately recorded, have certainly reached a higher total than any of us like. In searching for the cause of the comparative rareness of fatalities under chloroform, according to some statistics, and the relative frequency according to others, one is glad to find any reason which throws the fault, if fault there be, rather on the patient than on the administrator. The report of the 2nd Hyderabad Commission teaching, as it does, that respiratory failure is more to be dreaded than cardiac, is credited by some, with being the indirect cause of some of the recent deaths. For, according to those who hold these views, attention has been paid to the respiration, when it should rather have been directed to the pulse. It should, however, not be forgotten, that a certain school, the Scotch, habitually administer the drug in this way, and it is hardly to be credited that it would receive the imprimature of so justly celebrated a school, as the Scotch, if the method were wholly bad. Dr. Crawford, of the Madras General Hospital, reports that at his Institution, there has been no fatality within his knowledge, though probably, it is administered in about one thousand cases every year and the Scotch method is adopted. Dr. Crawford is of opinion, that the chief cause of this immunity, is the absence of anything like nervousness on the part of the patients. They are familiar with the narcotic action of opium and see it in daily use. They have never heard of fatalities from taking chloroform, and therefore, pass under its influence without the slightest alarm; moreover, they are of a far more placid disposition than is the ordinary European, thrown, as the latter is, in the busy turmoil and worry of life. Fortunately, for members of our Profession, the use of Nitrous Oxide gas has so almost entirely superseded the need for Chloroform, that the question is not of so immediate concern to us, as, it would otherwise have been, nevertheless, Chloroform is still, undoubtedly used largely in the Provinces, especially in those cases where many extractions have to be made and only one visit can be given to have it done. Unfortunately, we cannot give our patients a placid disposition if they have not one, we cannot give them a peaceful existence if their's is one of worry and work ; we cannot tell them fatalities never occur, for alas! they do, and moreover, patients know of these fatalities as well as we do ourselves, but we can, fortunately, do something to soothe them, by word of mouth, by an appearance of confidence ourselves, and by an absence of that professional fussiness which some regard as being so correct, but which is, in fact, essentially stupid and wrong.

In connection with Chloroform, it is interesting to note the statement of M. LeRoyde Mèricourt, that though in the French Navy & Naval Hospitals, the drug is administered in about 60,000 cases every year, there have only been, so far as can be ascertained, four deaths since 1856. The reason assigned for the superiority of these results over those obtained in the French Civil Hospitals, is the fact that whereas, in the latter, an ordinary compress is used, in the Navy it is administered by means of a truncated card board cone with a diaphragm of flannel.

Among other reasons, which have been assigned as the cause of some of the fatalities, is impurity of the Chloroform employed. Professor Pictet has lately introduced a new method of producing an absolutely pure drug. This consists in crystallising out the Chloroform by the aid of intense cold. The impurities remain in the mother liquid, but the process is not carried so far as to remove all the Chloroform so as to be always on the safe side. In a recent issue of the *British Medical* an interesting series of experiments by Dr. Rene du Bois-Reymond are given. These experiments embraced observations both on frogs and on rabbits, and were made with Pictet's purified Chloroform and with the impure mother liquid, which latter was sometimes concentrated. In the case of frogs slowing of the heart occurred with both drugs, but more so with the impure, moreover, with this the character of the beat was altered, the heart remained abnormally long in diastole and its contraction approached the peristallic type. As regards rabbits the following is the brief summary given of the action obtained with the two drugs :—

1. No difference was found in the shape of the pulse waves nor in the frequency of respiration, the former being equally affected by both drugs, the latter varying freely.
2. The pulse rate, compared in nineteen cases, is higher at the close of the experiments with residue than of those with pure chloroform.
3. The blood pressure in by far the greater number of the experiments at the moment the respiration stops is higher after inhalation of pure chloroform than after inhalation of the impure residue.
4. The residue causes stoppage of respiration much more quickly than pure chloroform.

During the Lettsomian Lectures on the surgical treatment of trigeminal neuralgia delivered before the Medical Society of London, Mr. William Rose gave a demonstration of his method of removing the Gasserian ganglia. We may briefly summarize the steps.

1. An incision is made from just below the external angular process of frontal along the zygoma to its end and thence to the angle of jaw, them along the lower border of this to facial vessels. This flap is thrown forwards with the facial nerve, and Stenson's duct.

2. The zygoma is drilled for future wire sutures, then sawn at both ends and thrown downwards with masseter. The Coronoid process is then exposed, sawn and turned up with temporal muscle.

3. The internal maxillary artery is sought for, ligatured and divided. The external pterygoid muscle is removed, and the foramen ovale sought for. This is difficult to find and requires great care.

4. A trephine half an inch in diameter is applied, a little anterior and external to the foramen, on the great wing of sphenoid. The hole can be enlarged if needed.

5. The stump of 3rd divison of fifth leads to ganglion and it is removed piecemeal with hooks and curette. The 2nd division of nerve is sought for and divided but the first is not

6. The parts are washed and replaced, but the coronoid process is better removed, no drainage tube is needed. The cases in which this operation has been performed have all been for tic of exceptional severity and most appeared to have commenced in the teeth. The results have so far been comparative immunity from pain, but the time is hardly long enough to say whether the cure is absolute. There is at any rate great relief. The area of anæsthesia has lessened but there is a tendency to ulceration of cornea. There is some stiffness about the jaw, but this is less where the coronoid process has been completely removed.

The suggestion of the late President of the Odontological Society that this Society should seek to become a Royal Society and that members should use the M.O.S. as a kind of ornamental affix to their names is, we learn from his Valedictory address, in abeyance till the Society finds a permanent home. Meanwhile the unhappy members must console themselves as best they can. It is well to notice that Mr. Hutchinson never regarded this as a qualification, but as a "higher diploma." In the name of common sense what is the use of a "diploma" if it conveys no qualification? The comparison of an M.orF.O.S. to the R.A.,or the R.W.S., or the R.I., does not hold water, for all these titles are only given *as a reward* for talent displayed and work done, but the Membership of the Odontological Society is given for *Entrance fee and subscription paid*, and commonplace respectability. Moveover, the aforesaid diplomas qualify to exhibit on the walls, and sundry other advantages, and Mr. Hutchinson says the M.O.S., is not to qualify. If a comparison be really needed we would suggest the M.S.B., (Member of the Shoe-black Brigade) but even this qualifies to clean boots at the street corners. No! we cannot see the need or advantage. The work that the Society does is known and valued, everyone should join (when he can pay the fees) but surely there are enough bogus affixes, R.D.S., R.C.S., and so forth, flying about without our premier Society increasing them.

Said Mr. Christopher Heath (see another page):—"If you have a denture which does not fit, and is constantly keeping up irritation, and particularly if it is never taken out of the mouth, ulceration is set up and by irritation developes into an epithelioma." On theoretical grounds this is, of course, perfectly possible, but we should like to know whether it has ever happened? Whether an epithelioma has ever been clearly traced to an artificial denture however ill-fitting? We confess to have heard no such record. Have any of our readers?

We regret that we are compelled to hold over the discussion on this paper till our next issue.

We learn that his excellency R. C. Waller Bey, of Cairo, has been appointed Dental Surgeon to His Highness the Khedive, Abbas II. This is the third Khedive that Waller Bey has served in this capacity. The two former ones being Ismail Pacha, and the late Khedive, Tewfik Pacha.

The Athletic Club of the Dental Hospital of London, holds its Annual Dinner at the Holborn Restaurant, on Saturday, March 5th, at 6.30 p.m. Mr. Morton Smale is in the chair. Tickets can be obtained of the Secretary of the Club at the Hospital.

The College of Surgeons of Ireland have recently opened their new buildings, which include a large dissecting room, and chemical laboratory which are lighted by the electric light. They have been erected at a cost of £5,000.

It seems not improbable that the new University for London will not be called the Albert University, but the Gresham University. On this condition the Gresham College have offered to place their buildings and funds at the disposal of the University, thus providing a home and at any rate a certain assured income towards founding professorships.

The amount of illness caused by attending funerals and standing bareheaded in this most variable of climates has long attracted attention. We are glad to note, therefore, "that the Bishop of Nottingham is of opinion that anyone would be showing every respect on these solemn occasions if he wore a black skull cap."

Selection.

THE CROONIAN LECTURES.

On the Progress of Discovery Relating to the Origin and Nature of Infectious Diseases.

Delivered at the Royal College of Physicians, London.

By J. Burdon-Sanderson, M.D., Ed., F.R.S., &c.,
Professor of Physiology in the University of Oxford.

LECTURE III.

(*Concluded from page* 131.)

Among the specific diseases in which the advocates of phagocytosis attribute importance to the protective action of leucocytes, the most remarkable is relapsing fever. In this disease, as everybody knows, spirilla are present in the blood in great numbers during the paroxysm, and disappear at the crisis. Metchnikoff,* availing himself of the fact (first discovered by Dr. Carter of Bombay) that this disease can be communicated to the quadrumana, for the purpose of thoroughly investigating it from the bacteriological side, has given us a full account of all that happens. In agreement with other observers, he has found that, although the spirilla are in constant relation with the blood leucocytes, they are never incorporated by them ; and he has further made the important observation that when at the critical defervescence they disappear, they are deposited in the spleen and incorporated in its cells. Strange as it may appear, Metchnikoff gives no explanation of the indifference or phagocytic incapacity of the blood leucocytes in this case, but regards incorporation in the spleen cells as the cause of the defervescence. That it is a phenomenon of very great interest no one will dispute, but we can scarcely make up our minds to believe that it is the cause of an event already accomplished. Those who desire other examples of the same kind will find them in the notes which I hope to append to these lectures when published. The considerations I have brought before you are, I think, sufficient to justify us in not assigning the first place to phagocytosis in the mechanism of immunity. What I have now to do is to state what advances have been made by pathologists towards a more rational explanation. I will not occupy your time with proving what I conceive to be the most elementary fact relating to the subject—viz., that the organism (*i.e.*, the living human or animal body) possesses means of arresting the development within itself of pathogenic microphytes and of eventually destroying them. I will also ask you to be prepared to admit that this function resides both in the blood and in the tissue—both in organised protoplasm and in intercellular liquid, and consequently that the inhibitory or destructive action is chemical. In accordance with this principle, we should expect that susceptibility would consist in the impairment or suspicion of this function, and the acquirement of immunity in its development. Eight or ten years ago, the notion that immunity was due to chemical unfitness of the living body to serve as a nutritive medium was accepted with much less question than it is now. There were two opposed theories on the subject, commonly designated as that of exhaustion and that of retention. According to the exhaustion theory (that of Pasteur), it was thought that, just as in cultivation liquids bacteria undergo attenuation and eventually die if inadequately supplied with nutrient material, so in the body some special material necessary for the development of the microphyte, and consequently of the morbid process with which its growth is associated, is used up, and cannot be replaced. And so for want of this material the organism becomes unsusceptible. The other theory, that of retention, was founded on the fact that in nutrient media outside of the body, in which microphytes have lived for a long time, certain products of their vital chemical processes accumulate which are more or less colytic. And it was thought that in the living body a first attack might in like manner leave behind metabolic products (as they are called), which, taking their abode in the organism, might guard it against further attacks. In the crude form which it originally took, the hypothesis that the chemical compounds of known constitution, and particularly those belonging to the aromatic group which are known as products of sepsis, could produce such effects, became untenable as soon as it was proved that the colytic activity of those bodies is so feeble, and the quantity in which they are produced so small, that they cannot have any appreciable action. But the following out of the same idea—the idea; namely, that in the vegetation of pathogenous microphytes, products come into existence which are inimical to their own development—eventually led through a succession of steps in experimental research to the better knowledge which we now possess. The first of these steps was, I think, the discovery by Messrs. Salmon and Smith* that pigs can be "protected" against pig typhoid by inoculating them with the liquid in which the microphyte of that disease has been cultivated. The same year a similar discovery was made by the late Dr. Wooldridge respecting certain liquids in which the bacillus of anthrax had been grown. This was a year later succeeded by the discovery of Chamberland and Roux that in guinea-pigs immunity from splenic fever was acquired by injection into the peritoneal cavity, of cultures of bacillus anthracis, in which the microphyte had been effectually destroyed by heat. This method had the disadvantage that the high temperature which it is necessary to use in order to ensure the thorough devitalisation of the microbe was more or less destructive to the chemical products which it was desired to separate. The recognition of this drawback led to the use of a new expedient, or rather to the reapplication of an old one in a much-improved form—that of filtration under pressure through porcelain, by means of which it was found that a germ-free filtrate could be obtained which was much more active than the liquid obtained by heat devitalisation. As to what happens in the particular cases we have before us it is sufficient for the moment to say that the protective action of the filtrate is not due to its direct action on the bacilli, for it has been shown experimentally that these organisms grow and multiply in the very liquids which serve as vaccines, and that consequently we must look for our explanation to its action on the infected organism rather than on the infecting microphyte. In accepting this inference it is obvious that we at once abandonthe very clue which guided us to it. For if it can be shown, as we shall see to be the case, that these chemical products of bacterial life, although they have no such power outside of the organism, are actually able to exercise it within the organism—*i.e.*, when used as vaccines,—the only view which we can take of the matter is that when used as vaccines they so act on the organism as to awaken in it an inhibitory or destructive power which was before latent or too feeble. This being so, it naturally follows that the question to be next investigated is rather that of the nature of the reaction than of the microbe which causes it, and that the most important thing to do is to make a comparative investigation of the properties of the tissues and fluids of the body in protected and susceptible animals. It has been long known (specially from the research of Morita Traube in 1874) that the blood possesses an extraordinary power of destroying septic organisms, but no one recognised its importance in relation to infection until, in 1887, von Fodor published his paper on the power of the blood to destroy pathogenic bacteria. Von Fodor showed, first, that bacillus anthracis when injected into the blood is destroyed with extraordinary rapidity, and he tested the process by a method to which we shall have to refer later. Then followed the much more elaborate research of Dr. Nuttall, made under Flügge's directions, which showed that the bacterium-killing power which von Fodor had assigned to the blood in its uncoagulated state, was possessed both by defibrinated blood and by serum, and was destroyed by subjecting it to a temperature of 55° C. This research was succeeded by another of equal importance also conducted in Flügge's laboratory. It was found that defibrinated blood could be diluted with sterilised salt solution without losing its antibiotic power, that it acted much more readily on some microphytes than on others, and particularly on the bacillus of typhoid, that it belongs as much to plasma as to serum, and is not destroyed by those products of peptic digestion of proteids which deprive blood of its coagulability. Finally, this subject was more fully investigated by Buchner, who confirmed and extended the results of his predecessors, while correcting some mistakes*. As it is out of the question to go into details, I must content myself with first giving you a short account of the method of testing the antibiotic power of blood, serum, or any other animal liquid, and then stating the results in relation to the destruction of the bacillus of typhoid by serum.

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* Metchnikoff: Phagocytenkampf beim Rückfalltyphus. (Virchow's Arch., ol. cix.)

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* Experiments on the Production or Immunity by Hypodermic Injection of Sterilised Cultures. (Internat. Med. Congress, Washington, 1887. A preliminary communication had been made at an earlier period to the Biological Society of Washington.)

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* Untersuchungen über die bakterienfeindlichen Wirkungen des Blutes. (Arch. f. Hygiene, vol. c., p. 85.)

The method of testing consists in very thoroughly mixing with say, 5 cc. of serum, a measured quantity, say 5 c.m.—*i.e.*, one-hundredth part—of culture; then in taking the same quantity—5 c. m.—of the mixture and diluting it with warm gelatine solution, which is immediately poured out on a levelled glass plate, and subjected to such a temperature as will just admit of its gelatinising. In a couple of days the surface of the gelatine is beset with dots of opacity—colonies of typhoid. These can be counted by placing the plate over a plate of glass divided into squares, of which the area is some simple multiple of that of each square. In this way a numerical result is obtained which represents the original number of bacilli contained in the culture used, and thereby serves as a standard of comparison in other observations. The next step is to repeat the process with samples of the same liquid —*i.e.*, serum—containing 1 per cent. of culture taken two hours and a half and five hours respectively after mixture, the result being that for every 100 microphytes originally existing not more than one or two are forthcoming after five hours in serum. By applying the same method of testing to serum and blood under other conditions, it is learnt that serum may be kept for a week or more at a low temperature without losing its antibiotic power; that this, moreover, is not diminished by freezing and thawing, even when several times repeated; whence it is abundantly evident that the property in question is not due to the stray corpuscles which serum always contains, for these are effectually killed by a single freezing. From a variety of circumstances, Buchner is led to infer that the antibiotic power is associated with the proteid constituents of the serum. The fact first observed by Flügge and confirmed by Buchner, that the action is destroyed by a temperature of 55°, accords best with the properties of a proteid; so also does the observation that when serum of dog's blood is repeatedly frozen it divides by subsidence into two layers, of which the lower is active and the upper sterile. But the most decided indication of the albuminous nature of the agent is given by the effect of diffusion. If a plate of gelatine is soaked in serum, the gelatine swells and charges itself with water and salts of the blood, and it is found that the antibiotic power is entirely lost, both serum and diffusate being now favourable media for the growth of the bacillus.

New facts have been very recently brought to light which give the discovery of von Fodor its true meaning. So far as I know, no pathologist supposed that the specific insusceptibility which, as we have seen, may be conferred on animals by so many different ways (and I have by no means mentioned all), is due to the general property possessed by the blood of destroying pathogenic microphytes. It was from the first understood that the whole value of Buchner's research consisted in this (and it was abundantly sufficient to give it great importance as a step in the progress of knowledge), that it brings before us in the clearest way the possible existence of a chemical agency in the living organism—an agency in which cells as such take no part—capable of destroying infective microphytes as rapidly and effectually as corrosive sublimate. For the proof of the existence of such an antibiotic power and of its embodiment in a chemical substance afforded good ground for the anticipation that the specific antibiotic power which was already believed to be resident in the organism of specifically protected animals would be in like manner chemical, and independent of the coöperation of living cells. Consequently the question came to be one of a specific chemical agency analogous to that proved to exist by Buchner's experiments. No sooner did the question present itself than it was seen that in each case the specific agent might act in one of two ways, or both at the same time, but in different degrees. It might act either antibiotically or antitoxically, or both at the same time. It might protect either by destroying or exhibiting the development of the microphyte, or by antagonising its chemical action. Now we have seen, as regards phlogogenic microphytes, that the weapon by which these exercise their power of injury is a chemical one ; and from the experiments of M. Bouchard and Dr. Ruffer we learn that this same weapon is employed by the microphyte as a means of promoting its own victory in the struggle for existence. If, therefore, we can deprive it of this weapon, we not only make it harmless, but so impair its viability in the organism as to put a stop to its multiplication. In other words, the specific chemical agent by which the organism protects itself against a specific infective process is at the same time antibiotic and antitoxic ; but of these two the antitoxic carries with it or includes the other. To disarm an assailant is equivalent in effect to killing him. Now it is known that certain infections are biotic, others toxic—*i.e.*, that in some, rapid multiplication of the organism is the potent element, in others the production by a relatively small number of microphytes of a relatively intense toxic action. Of the former class, splenic fever or a similar disease of pigs—pig erysipelas—is the type, of the latter, tetanus. If, therefore, we assume that the specific alexeteric agent may possess the antibiotic and antitoxic properties in different proportions, according to the disease against which it serves as a defence, we should expect that the specific alexeteric against tetanus should be chiefly antitoxic, the specific alexeteric against swine erysipelas should be chiefly antibiotic. As regards tetanus, this has been proved to be so by the recent researches of Behring and Kitasato.* In tetanus it has been conclusively proved, as we shall see more fully in the next lecture, that the whole complex of symptoms produced by the tetanus bacillus also results from the introduction into the organism of an almost infinitesimal dose of the toxical product. It has further been proved (1) that it is possible, by a variety of methods which we have not time to enter on to-day, to induce in an animal a sate of complete insusceptibility to this poison, so complete that it is not affected by doses several hundred times greater than are sufficient to kill an unprotected animal; (2) that the blood of such an unprotected animal has the power of antagonising the poison, though not of inhibiting the growth of the microphyte which produces it; and (3) that when introduced into the circulation of a susceptible animal it confers immunity upon it. These facts speak for themselves so plainly that they do not need comment, but it is essential that we should carefully guard against the assumption that the fact that in tetanus the protective agent is primarily antitoxic is also true as to other diseases. To prove that it is not so, let me ask your attention for a very few minutes to what has been ascertained as to the specific protective agent against the disease I have mentioned as swine erysipelas, or (in French) Rouget. Rouget is a disease which kills rather more than half of the animals which it attacks, and is characterised by its rapid progress and the spreading erythema which accompanies it. The bacillus which causes it was discovered by Loeffler in 1882, and so closely resembles that of another disease—"mouse septicæmia"—that they can scarcely be distinguished. It is found in great abundance in the blood of infected animals, and continues to multiply after death. It derives a special interest from the investigations of Pasteur, who discovered first that its virus could be mitigated, though not attenuated, by transmission through the body of the rabbit, and that it could be aggravated by transmission through the pigeon, and that pigs which have received the disease through the rabbit were protected against the pigeon virus. Rouget has a further importance as one of those in which it is alleged that the agency of leucocytes can be best observed as destroyers of bacilli. On this ground, as well as from the circumstance that the relation between virulence and morbid process which it occasions is quite as obvious—as, *e.g.*, in splenic fever,—we take rouget as a disease specially adapted for the discussion of the mechanism of acquired immunity. In Rouget it has been proved that the multiplication of the bacilli in the blood of a susceptible animal is astonishingly rapid, but that the bacillus is as rapidly destroyed in an animal of the same species in which immunity has been conferred by Pasteur's method ; in other words, the antibiotic property of the blood—*i.e.*, its power of destroying morbific bacilli—is in that disease associated with the acquirement of immunity. It is well known that protection afforded by Pasteur's method for rouget is not absolute—*i.e.*, that a certain number of the vaccinated animals are attacked by the disease, and some die, and that for this reason it has not come into use like Pasteur's other modes of vaccination. Emmerich* succeeded better by adopting a different plan, which consists in first introducing per venas a very small dose of a virulent culture and then ten days later injecting a full dose. As the second injection produced no symptoms, it might be regarded as absolute immunity, but in order to ensure its thoroughness, larger quantities were injected subsequently. In this way a number of healthy rabbits were prepared, the whole process requiring about four weeks for its completion, and the next step was to compare them as regards the antibiotic properties of their blood and tissues with normal rabbits. The gist of the experiments is that whereas in the susceptible animal the effect of introducing half a centimeter is to produce a process in which the blood is crowded with microphytes, and they are also found in the tissue, the bacilli introduced into the circulation of the protected animal have almost disappeared in three hours, and are absolutely destroyed in less than eight hours.

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* Ueber das Zustandekommen der Diphtherie-Immunität bei Thieren. Deutsche Med. Wochenschrift, 1890, p. 1113.)

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* Emmerich und Mastbaum: Die Ursache der Immunitat (Archiv f. Hygiene, vol. xii., 1091, p. 275.)

Having got thus far, having proved that what I may venture to call the antibiotic state can be produced in an animal by a process of gradual habituation, it was evident that to Emmerich, as regards the particular disease and the particular animal under observation, he had the rest of the problem in his hands. It was true that the antibiotic effect was produced in the organism—that the bacilli were effectually killed, both in the blood and tissue of the immune animal, whereas they multiplied in the susceptible—but it could not as yet be positively stated whether the agent by which immunity was conferred was an essential product of their metabolism, such as they might be expected to manufacture in any nutrient medium adapted to their growth, or a result of their action on the living tissues of the infected body. And the way to do this was evidently not to operate on the bacillus, but on the blood and the tissues of the immunised rabbit, in which two facts of great moment were already known—first, that no bacilli were forthcoming; and, secondly, that the antibiotic property resided in them. This purpose was accomplished by the method of filtration through porcelain, to the immense value of which as a method of pathological research I have already adverted. By subjecting the previously comminuted tissues of an immunised rabbit to extreme pressure, and collecting the expressed juice in sterilised flasks, and filtering through porcelain, a liquid is obtained free from all structural elements, which, when injected into the body of a normal—that is, susceptible—rabbit, produces no disturbance of any function, but confers upon it an *antibiotic state*, so that if a sufficient quantity of the liquid is injected immediately after a fatal dose of the virulent culture of rouget the development of the disease is averted. What happens is best shown by comparing the temperature curve in such an animal with the curve which would have been obtained had the virulent action of the bacillus—*i.e.*, the development of the disease—been left to itself. It is obvious that in the curve marked I. in the figure, there are indications of a slight febrile reaction which immediately follows the injection, whereas in the other the body temperature of the affected animal culminates on the fifth day with a temperature of 100o. On testing the condition of the blood by plate cultures, it was found that, as in the immune animal, there was no multiplication of bacilli. In other experiments, instead of introducing the virus and its antidote simultaneously, the injection of the former (the virus) was deferred for twenty-four hours. The result was much the same, showing that the effect continues for some time after the material itself has been discharged from the system, and this inference was confirmed by observing that even after eleven days the effect of a fatal dose was much mitigated, for the disease ran a favourable course, ending in recovery. These experiments show that the introduction of a soluble product into the organism of an animal susceptible to rouget restrains or inhibits the development in it of the bacillus. A few years ago this would have been attributed (in accordance with the retention theory) to the direct action of the product on the microphyte, but this we can no longer admit now that we know that in several instances pathogenic microphytes grow and multiply without check in the bodies of infected animals, and that this growth continues after death, until the pathogenic microphyte is overpowered by saprophytes. Consequently we are led to adopt the only possible alternative—viz., that although the agent by which the pathogenic microphyte is destroyed or its development arrested is a chemical one, it is not identical with or contained in the substance which has been introduced, but is what in physiology we call a metabolic product.

We have learned to-day that the organism of man and of the higher animals possesses a self-protecting power, which it can exercise either in arresting the development of the living excitors of disease or in counteracting their poisonous products,—in other words, that it is endowed not only with a general *vis protectrix*, but that it is able to bring into existence specific vital activities by which it guards itself against the specific infections to which it is exposed, and (what is practically most important) that these activities have chemical embodiments which are within the reach of experimental investigation. To have learnt this is to have entered on the beginning of a new progress—to have turned over a new leaf in Pathology and in Preventive Medicine. It seems to me to require no prophetic power to foresee that we are just now on the threshold of discoveries such as will surpass in their practical value, no less than in their scientific importance, all that have preceded and led up to them. Happy are they who are young enough to hope to participate in the realisation of so encouraging a prospect!

Abstracts of British & Foreign Journals.

ALUMINUM.

By C. C. Carroll, M.D., Ph. D.

Sir,—In your issue of May 6, under the caption "Contempt for Aluminum," some pessimistic wiseacre, writing over the initials "C. M." claiming to be a "chemist of extensive practice," attempts to enlighten the public regarding the properties, cases and present status of aluminum, in a series of dogmatic statements which are as erroneous and misleading as they are devoid of scientific knowledge. That there have been errors, promises and prophecies regarding the immediate cheap production of aluminum promulgated in the public press, is no doubt true ; but none that has fallen under my observation is more wide of the truth, as to the literature, chemical and metallurgical properties and uses of aluminum, than the article above referred to. While aluminum is one of the most abundant elements found in the earth's crust, even more so than iron, yet its true function in the arts and mechanics will not be to displace iron for heavy machinery, but rather to take rank as a royal metal along with gold, silver, platinum and iridium.

Aluminum, like other elemental metals, such as gold, silver, and iron, will not find its chief use as a pure and unalloyed element, but rather as an alloy in combination with other metals. Gold and silver when pure are too soft and too subject to attrition, as well as devoid of other necessary properties that require them to be alloyed for use in the arts, as well as for wear in coin. Iron, at present the most useful to man of all metals, is entirely worthless as a pure and simple element, finding no place in nature or applied mechanics in its pure and unalloyed form : and it is known only as a curiosity in the chemical laboratory. It is only when alloyed with carbon, silicon or aluminum that iron becomes of such universal use to man, by taking such properties, according to combination and manipulation, that enable us to employ it, at a small cost of a few cents per pound, as the foundation on which the iron locomotive pursues its swift course across continents, dragging in its long train vast treasures of life and property; while in other forms and combinations, as with aluminum, in the Damascus blade, its value represents many dollars per pound; or, when manufactured into fine screws and hair-springs of the watch, many hundred dollars per pound.

So it is with aluminum to-day, now that we have learned, as the result of long-continued research of inventive chemists and metallurgists, some of its hitherto hidden secrets, and can cast, weld, and solder it perfectly.

I have exposed pure aluminum and its alloys, which I have made, for long periods to salt air and salt-water, without any sign of tarnish or oxidation of surface. It is because of the purity and resistance to change of aluminum that the medical profession commend its use to the dentist instead of rubber that is being worn in the mouth with such frequent injurious and sometimes fatal effect; as well do they commend aluminum, and it is now being used here in New York for cooking utensils instead of iron, copper and brass, having the advantage of taking heat rapidly and retaining it longer than any other metal, at the same time being pure, clean and healthy, entirely free from the poisoning effect of copper and brass when oxidized, as they so readily are, to the annoyance of the good housewife and jeopardy of life from verdigris poison.

Aluminum, when pure, and especially in its alloys, has a great tensile strength. Some that I have in my laboratory has a tensile strength of over 100,000 pounds to the inch, while steel has only about 65,000 pounds tensile strength. Aluminum can be made very soft, and can be beaten into foil like gold, or amalgamated like silver, as I have recently demonstrated, making it susceptible of use more advantageously than either gold or silver for the preservation of natural teeth, as it does not tarnish and is less conspicuous in wear, besides being less expensive; and as a substitute for gold would represent a great economic saving, as it is estimated that over a ton of gold is consumed annually by the 50,000 or more dentists who are daily packing it away in teeth, never to be returned to economic use.

The peculiarities that heretofore precluded this wonderful metal from taking a prominent place in the arts and sciences have at length been mastered. The difficulties of casting, welding, soldering and tempering have been overcome, so that now it has an unlimited application in the arts wherever gold, silver, platinum, brass, copper and iron are used. It can be alloyed with all the metals, producing combinations with wonderful properties, greatly enhancing their value in mechanics, fine arts and the professions. In surgery, general and special, it has an unequalled place for instruments and appliances that will not oxidize or be acted upon by medicaments or septic matter.

Aluminum combines extreme lightness with tensile strength conductiiblity,tenacity,and malleability and takes a fine temper and lasting polish. It is neither acted on by sulphuric nor nitric acid. Aluminum has a marked affinity for other elements, such as iron and silicon, with which it readily forms a bond that is difficult to sever, and hence there are as many grades of quality in aluminum as there are in iron. So, in speaking of aluminum, it is necessary to discriminate between chemically pure aluminum and the more common grades known as the aluminum of commerce. The price of the better grades of commercial aluminum, all of which contain iron and other impurities in greater or less per cent., and which sustain about the same relation to chemically pure aluminum that pig-iron does to the finest steel, has been reduced, in the past two years, from fourteen dollars to one dollar per pound, which is likely to be followed by still greater reduction in the near future, but it is doubtful if the better grades will be produced below a cost of fifty cents per pound, for some time to come.

Archives.

AN APPLIANCE FOR THE PREVENTION OF PAIN OR SORENESS DURING MALLETING.

It consists of a piece of ¾-inch lead pipe about four or five inches in length, so formed that the point resembles a short foot plugger ; if this is held against the opposite side of the tooth being filled it prevents pain and soreness. As it sometimes must be held at the same time as the mouth mirror, this can be readily done by cutting off the handle of the mirror and putting it into holes conveniently drilled in the lead. This is the invention of Dr. Lathrop, of Detroit.

Dr. Keith also shows the following appliances for the rapid heating, soldering and cooling of small pieces for crown-work, bridges, bands, backings, etc. Take a piece of Russia sheet iron, shape it into the form of a small box, and fill with common sand. Any piece laid into the sand, leaving only the part to be soldered exposed, can at once be heated and soldered as there is no investing, drying or evaporating necessary. Also an improvement for fitting matrices to the sides of the teeth. For the matrix, No. 36 ribbon steel is used. Cut it to fit around the tooth, punch a hole in each end of the ribbon pass through the holes a small screw square at one end, two nuts of steel are threaded, the sides of them are the length of the crown of a tooth and each of the four sides is shaped differently so as to fit different class of teeth. The band is put around the tooth, the screws passed through the holes in it, and the ends of the steel band are drawn together by turning the screw. As the nuts fit the side of the tooth the matrix is drawn close up to the margins their entire length.—Dr. H. H. Keith.

Ohio Journal.

WATER AS AN ANÆSTHETIC.

By Dr. F. A. Lane.

After considerable study and experience in the use of cocaine for the painless extraction of teeth, I have been forced to the belief that this medicine was not all that could be desired for the accomplishment of that end. On the 8th day of July, as an experiment, I injected distilled water into the gum around the tooth till the gum became almost white, and then extracted the tooth, with the result that there was very little pain. On successive days I performed the following operations with the following results :

July 8th. Two badly decayed lower bicuspids, both ulcerated, without pain.

Second case. Lower left third molar, without pain.

Third case. Two upper third molars, considerable pain.

July 9th. Lower right bicuspid, without pain.

Second case. Lower right bicuspid, ulcerated, slight pain.

July 11th. Lower left second molar, slight pain.

July 13th. Lower right first molar, no pain.

July 14th. Second upper right bicuspid, considerable pain.

Second case. Upper right second bicuspid, very slight pain.

July 15th. Lower left first molar, very slight pain.

I have used it since July 8th, in the above manner, and find that my success has been as marked as with cocaine, with no risk of poisoning. Having watched all the above cases, I found, that with the exception of the last one, they all healed rapidly and without soreness, while with cocaine most cases suffer from extreme inflammation of the gums.

Cosmos.

MANIPULATING CEMENTS.—Dr. Wassall says: "I think there are two secrets in the use of cements that will give us better success with them. First, to take just enough of the plastic material on the instrument to fill the cavity, and burnish it until it is exactly full, so that it will not need to be cut or ground down after it has hardened. This leaves a surface which has an outside gloss to it, of a condensed vitreous nature. The other is to give the cement more time in setting before the rubber-dam is removed. It was Dr. Harlan who told that he allowed the rubber to stay on, as an invariable rule, one hour, after making a cement filling, and I have found it of great value.

Ohio Journal.

THE THIRD MOLAR.—A great many third molar teeth are under normal in size, so that if the first molar tooth is extracted you will have a smaller masticating apparatus to begin with. If the first molar tooth is extracted in anticipation of bringing forward the third molar tooth, and it happens to be one under size, then you have deformed that mouth. If the first molar is extracted on account of extensive caries at the ninth or tenth—not later than the tenth—year it is a perfectly justifiable operation; but to extract it simply because it may be decayed, or the teeth may be irregularly arranged, I consider bad practice.—Dr. A. W. HARLAN, *Chic. D. So., Review.*

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual Monthly Meeting of the Manchester Odontological Society was held at the Grand Hotel, Tuesday, Jan. 5th, the President, (Mr. I. Renshaw) in the chair.

CASUAL COMMUNICATIONS.

Mr. **SIMMS** brought for inspection a number of impression trays made from fusible metal, for taking impressions of the mouth, with Godiva gutta percha or other material. He strongly urged the importance of making a special tray for all but the most simple cases, as the advantage in the more accurate fit of the denture more than compensated for the extra trouble involved. The metal used was that introduced by Mr. Lennox, at the last Annual Meeting of the British Dental Association, and the method of procedure was as follows:—The impression of the mouth was first obtained by means of an ordinary tray and composition, and on the plaster model obtained from the impression, an even layer of Godiva was placed about three-sixteenths of an inch thick. Over this layer a tray of wax was to be moulded about the same thickness. The wax tray, to which a short handle of wax was to be fixed, was then invested in plaster in two halves. After the plaster had set, the two halves were separated, and the wax being removed, they were placed together again, and were ready to receive the metal. A ready way to melt the metal was to place it in a cream jug, which itself was then to be placed in a pan containing water and boiled. The two halves of the plaster mould were to be tightly held together in the hand while pouring the metal down the space formed by the wax handle, and the tendency of the metal to run between the two halves of the mould was prevented by soaping the joint.

The **PRESIDENT** drew attention to the use of a few drops of oil on an emery disc when polishing, the oil, he said, made the work more easy and the results seemed to be better.

Mr. D. **HEADRIDGE** showed models of a case of great interest; a case in which a supplemental molar had been formed with and united to a lower wisdom tooth. The teeth were united through both crowns and roots. Caries had occurred in one of the crowns, so the teeth had to be extracted. The specimen was handed round. He proposed to examine it microscopically and would report to the Society later on this point.

DISCUSSION ON THE DEMONSTRATIONS HELD AT THE PREVIOUS MEETING.

Mr. DOUGAN in opening the Discussion referred to the operation performed by Mr. Peter Headridge, in which a large gold filling was inserted in a lower molar and the cavity kept dry without using the rubber dam. He (Mr. Dougan), understood that Mr. Headridge had not practised this method for 20 years, and did not advocate its use. He simply did it, at the request of members of the Society to show how it was done, before the introduction of the rubber dam which now so greatly simplified their work.

He was delighted with Mr. Whittaker's porcelain inlays, which he thought were a step in the right direction. They had hitherto been in the habit of filling those cavities in the labial surface of incisors with gold, in years gone by. Then the German dentists originated the method of filling them with glass inlays, which produced good results, and on which they had had a demonstration by Mr. G. G. Campion. Since the demonstration many members of the Society had used them, who would probably not otherwise have done so. Mr. Whittaker demonstrated that the porcelain rod inlays were quicker to apply than the glass inlays. A hole was made of a suitable size, and the porcelain rod was ground to fit the hole. The result of Mr. Whittaker's work when finished, was so good that one could scarcely distinguish the inlay from the natural tooth.

He considered Mr. Smithard's apparatus for administering gas was very good, as it had the great advantage of leaving both the operator's hands free. He also saw their President make a lower denture in some fusible metal, which he intended to try himself. (Applause).

Mr. SKIPP said he was very pleased with Mr. Headridge's demonstration, and he might say it was the first tooth he had ever seen finished without the use of rubber dam. He (Mr Skipp), had always been under the impression that Mr. P. Headridge deprecated the use of tin in fillings, but the first thing he saw him use at the demonstration was a piece of tin. In regard to porcelain inlays, which he thought were of great importance in dentistry, he should like to say a few words as to their durability. In the first place they must have their burr running perfectly true. Mr. Whittaker had a handpiece which carried the burr perfectly true, and that was a great point. In a case where the decay went right across the tooth in a curved line near the cervical edge, he very much questioned whether the perfectly round porcelain inlay would be of much use. He thought the Richter method, demonstrated in a previous meeting by Mr. G. G. Campion, would be much more durable. He had seen the inlays Mr. Whittaker had put in, and they appeared satisfactory on the whole, but at one or two of the points would, he thought, break down, not through any fault of the operator, but simply owing to the enamel having been injured by caries beyond the joint of the inlay. The most suitable case was where the origin of the cavity was due to a defective spot in enamel. They had then a complete edge of hard enamel all round the inlay. The durability of the inlay depended greatly on the lasting powers of the cement by which it was retained. In regard to the gas extractions, he thought they were very good, but it seemed to him that the patients took a little longer to go under the influence of the gas than ordinary. That might, however, be due to Mr. Smithard using a new apparatus. It was certainly an advantage to have both hands at liberty.

Mr. DOUGAN said he had forgotten to mention the hot-air syringe. It could not be worked at the time as the battery was exhausted, but when it was in full working order, it was about the best hot-air syringe they had got, as it kept up one steady heat.

The PRESIDENT: It struck me that the hot-air syringe was rather too hot to hold long.

Mr. DOUGAN: That can easily be remedied with a little asbestos.

Mr. COLLETT said he should not have liked to perform Mr. Headridge's demonstration without using the rubber dam. In regard to the use of tin, the cavity filled by Mr. Headridge was one of the few cavities where its use was justifiable. He (Mr. Collett) looked upon tin as the lazy man's friend, and did not think the results obtained were more perfect than with gold.

Mr. Skipp : Do you use hard or soft gold ?

Mr. Collett : It is immaterial.

Mr. P. Headridge said he might have made use of the remarks attributed to him in regard to tin, but he did not recollect them. But where they had a large cavity and the nerve near the surface, he thought it was an advantage to use tin, which was a soft metal, and it did not require much pressure to insert it. He never used tin to line the edge of a cavity. Then again, in using tin they sometimes got the anchorage for the gold quicker than by using gold alone. He generally used tin for large cavities.

Mr. Whittaker said he did not agree with Mr. Collett in his condemnation of tin. He himself had known cases where a mixture of gold and tin filling in a tooth had lasted for upwards of 20 years. He had had a patient with such a filling in for 17 years. Where the tin and gold had touched the edge of the cavity, the filling was quite perfect, but where the gold had touched the edge of the cavity, it had failed. The tin and gold mixture was so hard that he could scarcely drill it out. He thought they got a more perfect edge below the gum with the mixture, and although he did not know what effect the saliva had upon it, still he knew it made a splendid edge. He greatly favoured the use of tin and gold in large cavities, as it enabled him to get through more work.

Mr. P. Headridge, referring to Mr. Whittaker's demonstration, said he thought that from the material of which the rods were made that they would be rather porous, and would not polish properly, the result being that in a month or two the surface of the inlay would be quite a shade darker than when it was put in. He considered the difficulty could be met if the manufacturers would use a body which had to be fired at a higher temperature as this would render the inlay less porous.

Mr. Whittaker said that with regard to the point raised by Mr. P. Headridge, he had not noticed any of the porcelain rod inlays which he had inserted, show any signs of discolouration.

Mr. David Headridge asked whether anyone present had found any deleterious effects to their eyesight through the use of the electric light.

Mr. Broughton said that perhaps he had used the electric light in operating more than anyone present, and it was, in his opinion, rather beneficial to the eyesight than the contrary.

Mr. G. G. Campion moved, and Mr. L. Dreschfeld seconded a hearty vote of thanks to the givers of demonstrations, which was carried with applause.

The meeting then terminated.

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL OF MANCHESTER.

The third Meeting of the Session was held on Tuesday, December 22nd, 1891.

The President, Mr. W. Simms, in the chair.

The minutes of the last meeting were duly read and confirmed.

The Secretary announced that Mr. J. C. Stokoe had resigned his position as Treasurer, owing to his leaving the town. Mr. D. Headridge moved that the resignation be accepted, and that a vote of thanks, with the best wishes of the Society for his future welfare, be forwarded to him, Carried unanimously. On the motion of Mr. D. Headridge, seconded by Mr. Leeming, Mr. F. L. Tanner was appointed Treasurer.

Casual Communications.

Mr. F. W. Minshull showed :—

(1) A typical syphilitic lower molar.

(2) A peculiar flattened upper bicuspid.

(3) Sixth year molar showing erosion of fangs.

Mr. D. Headridge showed :—

(1) A modified Lord plugger for non-cohesive work which he had specially made.

(2) A lower molar that he had been compelled to extract on account of inflammation supervening after a bristle had been broken in the nerve canal near the apex, the root being abnormal in the posterior canal.

Messrs. Simms, Minshull and Tanner also related experiences of broken bristles in pulp canals.

Mr. J. C. Lingford showed a two-rooted supernumerary from the upper incisor region of a girl of fourteen.

Mr. W. Simms showed an improvement on the vulcanite impression trays he had advocated in his paper on "Mechanical Dentistry," he now used "Lennox Metal" for this purpose, and fully described his method of making them in this material.

Mr. F. L. Tanner was then called upon to read his paper, "General Anæsthetics in Dental Surgery."

Mr. D. Headridge in opening the discussion referred to the inadvisability of giving too much gas to anæmic patients, and as to the advisability of administering gas to epileptic patients. He said he would like to know if there was any relation between the rate of the pulse and the rate of induction of anæsthesia. He preferred to have a length of tubing between the facepiece, and the supply bag, instead of having them close together as Mr. Tanner advised. He also thought that it was cheaper to make one's own gas, than to buy it.

Mr. J. C. Lingford thought that a silencer should be employed, as his personal experience was that the noise was very objectionable. He thought that sufficient attention was not always paid to the fixing of the gag, so as to prevent all possibility of its slipping during the operation.

Mr. C. H. Carrington thought that dental students did not as a rule spend sufficient time in the gas-room while at Hospital, and hence were "at sea," when on going into private practice they were required to undertake an operation under gas. He thought that the corsets should be invariably loosened, whether tight or not. In his opinion chloroform was preferable to ether, and the after effects were not so bad as they were sometimes said to be.

Mr. F.W. Minshull differed from Mr. Tanner with regard to the use of a supplemental bag, as he always used one. He also preferred to give the gas under pressure and referred to Bert's experiments. He was in favour of giving plenty of gas even to patients with weak hearts. He related a case where he had felt it his duty to advise gas though the patient's medical attendant had refused to sanction its employment.

Mr. Simms in closing the debate, referred to administering N_2O to anæmic patients. He cited a case where temporary loss of the use of one arm followed the administration of N_2O. He advised pressing the face-piece on each side of the nose, and referred to the difficulty met with in the case of persons with enlarged tonsils. He said he could hardly hold with Mr. Minshull that it was even advisable to go directly against the opinion of a medical man, though often they had only a slight knowledge of gas administration. He thought that some persons were alike inclined to run down chloroform too much, the majority of general practitioners knew something of $CHCl_3$ administration and little or nothing of ether, and he would prefer in such cases chloroform be employed in preference to ether. He thanked Mr. Tanner for his interesting paper, and that gentleman having replied the meeting was brought to a conclusion.

STUDENTS' SOCIETY,
DENTAL HOSPITAL, LIVERPOOL.

The Annual Meeting in connection with the above Society, was held Jan. 17th, 1892, and was well attended.

T. Mansell, Esq., in the chair. The Secretary read the Annual Report, which was of a satisfactory nature. He alluded to the marked improvement in the discussion of subjects brought forward by the students, and also stated there had been an increase in the number of Casual Communications. The Treasurer's report intimated that the Society had an increased balance in hand, which reflects great credit upon a Society so young in its formation. The retiring President, Mr. Mansell, then delivered a most instructive address, especially to students, in reference to their future career as Dental Surgeons.

The following gentlemen were then elected officers for the ensuing year :—

President :—R. H. Bates, Esq., L.D.S., Eng.

Vice-President :—E. J. Phillips, L.D.S., M.R.C.S., L.R.C.P., Eng.

Treasurer :—Mr. L. J. Osborn.

Secretary :—Mr. F. R. Guyler.

Council :—Messrs. F. C. Dopson, P. Hope-Johnston, and W. D. Parsons.

Several Casual Communications were then brought forward and freely discussed by Messrs. Bates, Mansell, Edwards, Alexander, Black, Roberts and Woods.

A vote of thanks to the past officers terminated the proceedings of the meeting.

Dental News.

EDINBURGH DENTAL HOSPITAL.

The Annual Meeting of the Directors and contributors to the Edinburgh Dental Hospital was held in the Hospital, 5, Lauriston Lane, January 29th. Lord Provost Russell presided over a good attendance. The report for the year ended 31st December last stated that the year had been one of well-sustained efficiency and usefulness. The total number of cases treated was 8617, being nearly double that of 1881. Of the 8617 cases, as many as 2200 had teeth stopped or appliances supplied, showing an increase of five times the number of cases treated consecutively in 1881. The most recent addition to the services rendered by the Hospital, the mechanical department, had been of immense benefit to the recipients, and promised to achieve that full measure of success which the managers anticipated when it was resolved to establish it. The directors were sorry to report that there was an immediate prospect of the institution being ejected from its present premises owing to the extension of the Royal Infirmary. This would cause much inconvenience and considerable pecuniary loss.

The Chairman, in moving the adoption of the report, said that the hospital was evidently growing and becoming an important institution in Edinburgh. After referring to the good work being done by the institution, he alluded to the statement in the report that the institution was likely to be ejected from their premises owing to the proposed extension of the Royal Infirmary, and stated that they did not know whether that extension was to go on or not until the contributors had said their last word on the matter. The report was unanimously adopted. The treasurer's statement showed the income for the year to have been £542 13s. 9d. (£220 more than the previous year), and the expenditure £393 14s. 5d.

Mr. W. B. Macleod moved that it be remitted to the Administrative Committee to purchase or lease premises, and also to take such steps as might be deemed necessary and expedient to collect funds for that purpose.

Dr. M'Laren seconded, and the motion was unanimously adopted.

On the motion of Mr. Lindsay Mackersy, W.S., (hon. secretary,) seconded by Dr. Smith, it was remitted to the same committee to amend the constitution and laws to meet anticipated changes of circumstances. The remainder of the business was formal.

LAW INTELLIGENCE.

High Court of Justice.—Queen's Bench Division.—(Before Mr. Justice Denman and a special jury.)

Partridge v. The General Medical Council and another.

This matter arose out of circumstances that have upon more than one occasion been before the courts, and the plaintiff now asked for a mandamus to order his name to be placed upon the dentists' list, under the Act of 1878.

Mr. Willis, Q.C., and Mr. Beddall were for the plaintiff, and Mr. Reid, Q.C., and Mr. Muir Mackenzie for the defendants.

It was stated that the plaintiff first started on his own account as a dentist about 1868, he having been properly educated for the position. The Dentists' Act passed in 1878, and under it two sets of persons were entitled to be registered, those who were in actual practice at the time and those who held diplomas from certain medical institutions. The plaintiff obtained a diploma from the Royal College of Surgeons, Ireland, and it was provided that a person holding such a diploma should not advertise for business. He was placed upon the register of dentists in 1878. In 1881 his sight began to fail him, and in 1882 he became blind. He started at Kensington a Ladies' Dental Association, and sent out circulars stating the terms. In July, 1885, the Irish College of Surgeons, upon this ground, cancelled his diploma, and in June, 1886, his name was struck off the register of dentists. The Court of Queen's Bench, however, directed his name to be restored to the register, and the decision was affirmed upon appeal. There was a provision that when a person had been convicted of disgraceful conduct in a professional respect his name might be removed from the register.

His name was removed, upon the ground that he had advertised, but the plaintiff now contended that the defendants had no right to act as they had done, and that they should be made responsible in damages for the way in which they had acted.

A great deal of evidence, documentary and oral, was laid before the Court.

Mr. Justice Denman, after going elaborately through the circumstances of the case, said that he should hold that there was no evidence of malice against the defendants. He felt bound to come to the conclusion that he must non-suit the plaintiff, though he had sympathy with him and was reluctant to do so.

After some discussion, judgment was given for the defendants with costs, but execution was stayed with a view to an appeal.

Mr. Justice Denman suggested that there should be some arrangement come to to prevent the possibility of there being a new trial.

The plaintiff said that he would wash his hands of the whole matter; he had had enough of it.

Mr. Justice Denman asked if anything could be done in the way of letting the plaintiff off costs.

Mr. Mackenzie said that his lordship's intimation should be conveyed to the Executive Committee of the Council.

APPOINTMENT.

Mr. T. Taylor Genge, L.D.S., appointed Dental Surgeon to the Bristol General Hospital, vice Mr. T. Cooke Parson, deceased.

VACANCIES.

Dental Hospital of London, Leicester Square.—Two Assistant Dental Surgeons: must be Licentiates in Dental Surgery. Applications to the Secretary, F. J. Pink, by March 14th.

Dental Hospital of London, and London School of Dental Surgery, Leicester Square. There is a vacancy for a Demonstrator. Applications to be sent to the Dean before 14th March 1892.

Messrs. Ash & Sons Limited, send us a copious Appendix to their Catalogue of 1886.

British Journal of Dental Science.

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PRACTICAL DENTAL HISTOLOGY.*

By Mr. A. L. Bostock.

Mr. President and Gentlemen,—When I was asked to take, for the first time, an active part in your discussions and read a paper on what should be a subject general to the profession, I was no doubt, like others before me, overcome with the consciousness that in acceding to the request, I had undertaken a task that I could certainly not look upon as one easy of accomplishment. My next thought was for a subject. Well, on this point came a desire to fix on one after the fashion of the speeches of some of our political leaders, treating of a subject they might or might not understand themselves, and one, their audience knew absolutely nothing about, and having been drowned in a mass of statistics and quotations, was just as wise at the finish.

However, my doubtful position was ended by a suggestion of the subject, which I am notified by the syllabus of our Society to bring before you this evening.

The subject is a broad one, and as shewn by the addition of Practical Histology to the subjects included under the new regulations in the Dental Student's curriculum by the examining board, is one of increasing importance to the Profession, as we owe to Histology many facts now admitted which were formerly controvertible.

We have yet several points in Dental Physiology, which remain to be decided, and in the settlement of which Histology will take perhaps the greatest part. The following are instances of what werequire to have absolutely demonstrated:—

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* Read before the Student's Society, Victoria Dental Hospital, Manchester.

(1). Exact mode of termination of the nerves in the pulp and their connection with the hard tissue of the teeth.

(2). Functions of the Dentinal Fibrils. These two points alone would enable us to better understand the subject of sensitive dentine and pathological conditions of the teeth. Probably we shall find the one connected with the other.

(3). Another subject requiring further Histological investigation is the process of absorption in connection with teeth.

As an example of how Histology has aided the study of Dentistry, I would mention the researches of Messrs. Underwood and Mills only ten years ago, which gave us the now indisputable facts in relation to the production and cause of Dental Caries, as before these researches were published opposition theories were advanced, and a right conclusion could not be accepted as proved.

I think from many considerations that we must allow that a microscope is a necessary addition to the already numerous instruments required by a dentist, and hope, after my remarks, some of my fellow students will be inclined to take the subject in hand, if they have not already done so.

As I understand that at a former meeting of our Society, a paper was read on the preparation of microscopic specimens of the hard tissues of teeth, I purpose confining myself to the practical side of the subject treating of the preparation of specimens of the Soft Tissue such as may be found in, around and in close connection with the teeth, such as may be affected by disease arising from the teeth, or likely when themselves diseased, to affect and bring about disorders of the teeth. The specimens I have brought represent the tissues in health, and the subject might be taken up later with the pathological conditions of the same tissues, which cannot fail to be very instructive.

I suppose few, if any, of my present fellow-students have done any practical Histology, although I hope by the reading of this paper to benefit them by placing before them some of the methods employed in histological work, and I trust my efforts in this respect from my elementary knowledge of the subject, will meet with your generous indulgence.

In examining microscopically any organ or complex body so as to be able to obtain a clear conception of the structure of the same, we must be able to recognize by their microscopic appearance the difference between the simple tissues, &c., such as epithelium, fibrous tissues, muscle, nerves, &c., and these simpler tissues should be first of all studied, and by the aid of staining reagents the difference in their structure will be understood, so that when a complex organ is under examination the differentiation of the various parts by the use of these staining reagents may be more easily recognized and confirmed.

First of all, specimens are required which should be fresh and placed at once into a fixing and hardening fluid. The most extensively used is Müller's fluid, made by pounding in a mortar the following substances;—Potassium bichromate, 12 grains ; Sodium Sulphate, 4.8 grains, and adding 1 ounce of warm water to dissolve these ingredients.

It takes 5 to 7 weeks in this to harden a tissue, according to the size.

Another hardening fluid is absolute alcohol, generally used first with an equal quantity of water, then the tissue put in a stronger solution, and finally kept in absolute alcohol until required. For certain special purposes, glands and similar tissues are placed at once into absolute alcohol, but if fat is to be demonstrated as present by blackening with Osmic Acid, the tissue must not be put in alcohol as fat is dissolved by this.

If any blood is in the tissue, before hardening, it should be washed away by leaving in normal saline solution, and the hardening should be carefully watched, and the fluid changed if it becomes turbid.

It is best to suspend the tissue in the fluid, and to shake occasionally to bring fresh fluid into contact with it.

If the specimen desired should be the pulp of a tooth in "*in situ*," it will be necessary to decalcify it, as similarly to show the absorbing organ of a temporary tooth. This is one point which is capable of further investigation, as our text books are not decisive on the subject, and I hope to be able in the future to devote some spare time to this purpose.

This decalcification may be done by various fluids, perhaps the best is the chromic acid fluid. A rapid process of using this is to place the specimen for 2 or 3 days in ·2 per cent. solution of chromic acid and water, shaking the bottle occasionally, and using plenty of the fluid, afterwards placing the specimen for about a fortnight in a solution of ·5 per cent. chromic acid with 1 per cent. of nitric acid added. Testing for the complete removal of the calcium salts is done either by pushing a needle into the specimen or making a section with a blunt razor. If found to be hard the decalcification is not complete. After being decalcified the specimen must be washed well in running water for some hours to remove the chromium salts, and can then be transferred to a 70 per cent. solution of alcohol, and kept in the dark, finally placing it in strong absolute alcohol until required, keeping it always in the dark.

The specimens will, by the treatment described, now be ready for cutting sections from, or preparing a specimen to demonstrate some of its histological elements.

Some tissues, such as are too small to hold in the hand, or those which would fall asunder during or after cutting, require the further process of embedding.

The general method of this being to surround the tissue with such a medium as paraffin. This is termed "embedding," or another procedure is by the Freezing method.

To treat the tissue to shew any of its elementary constituents it is sometimes requisite to place it, using small pieces only, in such a fluid as will soften or dissolve the interstitial substance. This treatment is termed "Dissociating," and a simple fluid for the purpose is one-third alcohol, *i.e.*, 1 of alcohol and 2 of water, and in which the tissue should remain 1 or 2 days. The tissue after this may be teased apart by using two needles, fixing one end with one needle, and separating the other end with the other needle, with or without the aid of a lens, as the case may require.

Simple embedding, such as may be sufficient for the purpose, may be done by placing the specimen between two pieces of carrot scooped out to receive it. With a sharp razor, after a little practice, sufficiently thin sections will be obtained by cutting through both the carrot and specimen, and should the section curl up it may be straightened by using a camel's hair brush to it.

Should the specimen be too delicate to obtain sections by this method, the paraffin embedding is perhaps the best. Two paraffins are used; 2 parts of hard paraffin to 1 part of soft paraffin is a convenient mixture, which will act well. This mixture is heated until it melts, in say a porcelain dish; the tissue is removed from the alcohol in which it has been kept, and dried with absorbent paper to remove any surplus alcohol, and then placed in the paraffin which has been allowed to cool just short of setting. The paraffin will on cooling and setting, thus entirely surround the tissue, and on cutting through the mass sections of any delicate tissue will be obtained without any displacement of its different parts. The tissue, if not already stained before embedding, may be done when mounting the cut section on a slide as afterwards mentioned.

If by any of the methods described, sections have been obtained, (except by the paraffin method), staining the sections may now be proceeded with. Sometimes the specimen may be stained "*en masse*" before cutting sections or embedding in paraffin, using such a stain as Borax-Carmine, which requires a few days for its complete effect. This stain is a diffuse one, acting especially on the nuclei, particularly if placed for a day in 70 per cent. Alcohol with 1 per cent. of Hydrochloric Acid added.

Another generally used stain is Picro-carmine, which acts as a double stain, the nuclei &c. being stained red, and other parts of the tissue yellow; this double staining effect being more pronounced after keeping.

The method of staining is to first place the section in water for a little while, if it has been preserved in Alcohol. It is then placed on the centre of a slide, the surplus water removed with absorbent paper, and then the section is covered with a drop of Picro-carmine stain. Cover the slide with a watch glass or some similar article, to prevent evaporation and leave to stain for about a quarter of an hour. Now remove the surplus stain with absorbent paper, but on no account should water be placed on the stained section, as it removes part of the stain.

The section stained in this way is usually mounted at once in Farrant's solution by placing a drop of that fluid on the section and covering with a round cover glass.

Logwood is also a good nuclear stain, especially for tissues hardened in Alcohol, also those from Müller's fluid, but tissues after treatment with Chromic Acid are difficult to stain, however, this may be encouraged by soaking first in a dilute solution of sodium carbonate. Should the tissue be overstained with Logwood, it may be remedied by placing it in dilute acetic acid, and then washing well with water.

Methyl Violet does for porous textures, staining cells and nuclei, but only slightly the intercellular substance. Staining requires several hours, these sections are to be washed with water and afterwards with Alcohol.

Silver Nitrate stains readily, darkening to brown or black on exposure to daylight. The part attacked is the intercellular substances, such as the cement between epithelial cells, &c. The fresher the tissues the better, ¼ or ½ per cent. solutions usually used and it may be used in conjunction with such stains as Logwood, and Picro-carmine.

Gold chloride used especially in connection with the termination of nerves. Method is to put small piece of fresh tissue in a half to 2 per cent. solution for half an hour in the dark, the tissue is stained yellow, it is then washed well with water, and exposed to bright sunlight for a day or two in water, acidulated with Acetic Acid ; by this exposure the stain is converted into a purple.

Osmic Acid is particularly useful for demonstrating the presence of fat which is stained black by it.

Assuming that the section has been stained, it now requires to be mounted. The general mediums are Glycerine Farrant's solution, Glycerine Jelly, and Canada Balsam. All except the last named, do not require the sections to be further treated, and sections may be mounted in these direct from water. The best way to get a section from water on to a slide, is to take a slide in the left hand and dip it three-fourths under the water; with a mounted needle in the right hand, pull the section on the slide and raise the slide out of the water. The section adheres to the glass, and if it is folded over, immerse it in the water, and manipulate it with the needle.

Glycerine is not used as a mountant, for such as have been previously hardened.

Paraffin embedded sections require in mounting the following treatment. First, the section requires to be fixed firmly on the slide. A fluid is used for this purpose, which is termed a fixative. One that answers well is 1 part collodion, with 3 parts Clove oil, a thin layer of which is placed on the centre of a slide and the section laid on this, and gently pressed into position. The slide is gently heated, this drives off the clove oil, and firmly fixes the section. As much as possible of the paraffin surrounding the section should before this have been removed by the aid of needles. The paraffin remaining is now to be removed. This is done by heating the slide and treating the section with sufficient turpentine to dissolve out the paraffin.

If tissue has already been stained, then clove oil is placed on the section to drive away the turpentine, and clear it. and then mounted in Balsam as described later on. If staining is required, the turpentine is displaced by absolute alcohol, then weaker alcohol, and finally water for aqueous stains, and then treated as mentioned for sections that have been prepared without the use of paraffin.

The method of mounting in Canada Balsam is to first remove with absorbent paper as much as possible of the surplus water or dye from the section, then dehydrate it by pouring methylated spirit on it, allow to remain for a minute or two, drain it off, apply fresh spirit and repeat. It is best to heat finally with absolute alcohol. It is now necessary to clarify or clear the section ; oil of cloves is generally used for the purpose, by placing a drop at the edge of the section, and flowing it under and over the section. It is advisable to examine the section under a low power of the microscope, to see that the clearing has completely taken place before removing the clove oil with absorbent paper. In these operations never let the section dry. The section is finally covered with balsam, and a cover glass applied.

The accessory materials required for this practical work, I have mentioned in describing the different processes, some few accessories are requisite, such as watch glasses, in which to place the sections to stain, &c. A razor, or section cutter, will be required. A section lifter and needles to manipulate the sections. A mounting block or card in order to place the section in the centre of the slide. Bibulous or absorbent paper, such as blotting paper or similar paper. Slides and various sizes of cover glasses, my preference is for all round cover glasses. Square cover glasses are generally recommended for sections mounted in Balsam, as they will keep without further treatment, yet in my hands these have not been a success, for though when first mounted and approved of as being neatly and properly finished, and put on one side, most of them by some law of nature that I have not troubled to define, when next examined, have undergone a change that I did not anticipate, whereas when in some few cases I used round cover glasses for Balsam mounting, this same law of nature seems to have been defied, therefore, I advocate round cover glasses and there is the further consideration that they are, if one cares to do so, much more easily improved in appearance by the ringing process than square ones. This brings me to the finishing touches requisite for the specimens to be preserved for future use. This is done as a necessity for all but Balsam mounted specimens, by placing the slide on what is known as a turn-table and ringing them, of course this may be done by hand, but not so neatly. With camel's hair brushes, one or two coatings of shellac varnish or some similar preparation is spread on the edge of the cover glass and adjacent part of the slide. This will prevent the later coats from running into the mounting medium under the cover glass. When dry, a few coats of white zinc cement is run round over it, and this may be further embellished with a ring of different coloured cements.

The slides being finished should be labelled with full particulars as to specimen, stain &c., for future reference.

The following will probably prove useful, taken from notes made from time to time from various sources of information.

A good mixture for cleaning glass slides.

Ammonia 10 drops.
Methylated Alcohol 2℥
Water ... ½ ℥
Rouge sufficient to make a cream.

To bleach Sections.

¼ oz. Chloride of Lime in 20 oz. of water; shake for ½ hour; let this settle, and then decant the clear solution, in which place the section only until bleached. Then place in solution of Sodium Sulphite 1 dram to 4 ozs. of water for one hour, then soak in water for 6 to 8 hours, occasionally changing the water, finally soak in distilled water. Preserve the sections in distilled water with 20 per cent. of Alcohol.

To make Logwood Stain.

Boil 2 ozs. of the coarse Logwood powder in 10 ozs. distilled water for ½ hour, strain, and add water to replace loss by evaporation; when cold, add for each ounce of the liquid, 60 grains Alum and 1 drachm of Alcohol, mix well, filter and preserve in a stoppered bottle.

To clean Cover Glasses.

Soak in Nitric Acid, wash and keep in strong Acetic Acid. Only require drying from this with clean cloth.

Microscopic examination of secretions and discharges to show the presence of organisms, &c., is easily done by lifting a drop of the discharge on a clean needle point and spreading on a cover glass, which is then dried over a Bunsen flame, and can be stained either by Methyl Aniline Violet, or Potassic Iodide Iodine. Particulars of these is given in the Appendix in

Sewill's Dental Surgery along with useful information regarding the preparation of specimens of carious tooth tissues. Information with reference to staining with gold chloride is given in Ash's Quarter Circular, of December, 1890.

The *British Journal of Dental Science* for July 1st, 1890, gives details for preparing combined hard and soft sections.

In conclusion, I trust that my remarks in conjunction with the sundry exhibits I have shewn, will have sufficiently simplified the subject of Practical Histology to those students who have done no practical work in this direction as to induce them to take the subject up in whatever leisure time they may have at disposal. It will certainly amply repay them for their trouble because it cannot but be full of interest, and aid them to a very great extent, in studying the minute anatomy of that part of the human body that is specialized by the Dental Profession.

PRESIDENTIAL ADDRESS.*

By Robinson Humby, L.D.S. Eng.

Gentlemen.—On meeting you this evening to begin a new year in the annals of our Society, it is usual, I believe, to deliver a few words of introduction. The kind of matter selected for the occasion depends largely on what is thought best by the occupier of this chair, and I am pleased to remember that no set of rules regulates the selection, but I am free to indulge my individual ideas uncontrolled.

I have decided to give you my views upon the demands which our work make daily, and have made in the past upon the inventive faculties of the members of our profession. I find that dentistry is an art in which there is no beginning that can be vouched for, and as far as we can see, no end, that we can foresee at present. That teeth formed of wood and secured by ligatures is an old art, and that later similar pieces of work tied in the mouth, but made from ivory, otherwise dentine, became the base; this was practised in my memory. The dentine of the hippopotamus in some cases being used, with the natural enamel left so as to roughly represent the teeth; then came the mineral tooth with platinum strips baked into their substances; and lastly after this vulcanite. Of course I need hardly remind you of the use of human teeth for mounting on dentures, or their uses as pivot teeth, the so-called crowning of to-day in its earlier state. I have mentioned these early advances in the art, just to indicate how far we have progressed, and you who know how we stand to-day with our resources to do our work, must, I think, congratulate yourselves that your ideal if a lofty one, is much more easy of accomplishment. How were those men situated who were trying honestly to do sound work, without the rubber dam, dental engine, antiseptic dentistry, porcelain teeth, and gum, and vulcanite, and yet when I was first pitchforked into a dental workroom, this was the case with the exception of the use of porcelain, and vulcanite. There are men who have said that vulcanite would ruin the prosperity of our art, I was told by another that the engine was not a fit thing to use, so brutal, &c.; referring to rubber dam, a well-known American dentist said to me, that since its introduction any fool could do cohesive work, as well as he could himself, clearly indicating ruin in the near future, all these reactionaries forgot to take into consideration that together with increased facilities there would arise a higher standard of work, and that if in the past their superior abilities put them in the front rank, so in the future their extra talents, plus increased facilities, would tend to keep them there.

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* Delivered before the Students' Society, National Dental Hospital.

I have seen many improvements and changes and have noticed that men who were ready to adopt and try new schemes were not necessarily those men who were the most proficient in their art, but were men who did not feel that sense of satisfaction with their work, and consequently set themselves the task to try new methods to reach the common goal, but whether the motives which prompted the discontented ones, were worthy or not, the result is the same to you gentlemen, you who possess no sneaking love for certain old fashioned ideas, you who by the wisely constructed dental curriculum are to receive a sound instruction in accordance with revised and accepted facts up to date, when all that is known by every member, is or should be the common property and possession of any member.

In order that this latter state of things may be fully realised such a society as this has been organised and maintained, and should be cordially supported and aided in every way possible, both by the staff, and students of this Hospital, any one failing to contribute to this end, is not only robbing himself but is depriving others of that which they have a legitimate right to demand.

I cannot but think that any want of support we experience is the result of an idea that the seniors have, that their presence prevents free discussion, while the student thinks he gets all he wants in other ways, and his interest is consequently languid.

I never could find the shy side of a student myself, and I believe I have seen him from nearly every point of view, and I don't believe in the awful presence, deterrent theory, but I believe those men who as students have been ready to undertake their obvious duty, have been men who at any rate are behind the absentees not truly as the number of diameters obtained, indicate the strength of a microscope so do the number of units of a society such as ours show our power, all other things being equal, I do not mean passive absent members, but live active ones.

There is an inexhaustible field of research and invention surrounding us in every direction, as soon as we condescend to climb down to our proper level, and are possessed with a sufficient amount of discontent, otherwise craving for further enlightment. Has Rigg's disease ever been exploited succesfully? can any of us say that we can explore and treat the roots of teeth in a way we should be satisfied with? Are we aware of the actual structure of the dental pulp, and tooth substance? Is preventative dentistry, the noblest part of our work as forward as we could wish?—Are our anæsthetics and antiseptics satisfactory. Is our treatment of our clients, as humane as it should be, to be accepted loyally by the dentist? If in his own person he felt the sufferings he gives to others. I could go on with the list until I had enumerated every single fact which aggregated, comprises the dental art.

Since we have been welded together into a profession, I claim that more progress has been made, and will be made in the future with 'loyalty, fraternity, and equality' as our watch words. I am not sure that my post is the one I ought to occupy, and as I have been ill for three weeks since my election, I could not do more than put together the foregoing remarks, and if I fall short of what you might have reasonably expected, please put it down to the effects of the prevailing epidemic.

FIRST AND THIRD MOLARS.

By Dr. Ottofy.

I do not think that with the methods we now have of saving the first molar that it need very often be extracted, we do not gain by that practice as much as we desire. As a general rule the articulation becomes disturbed, both by the dropping of the teeth backward, forward, inward or outward. The second or third molars do seldom as properly articulate if the first molars are absent as when they remain. Also, unless the second molar moves forward we will lose an extremely large tooth, and one which is better adapted for mastication than any other, by virtue of its location and the relation that it bears to the fulcrum and the muscular power exerted by the jaws. We can exert more force at that point than anywhere else, hence when possible, it is not good practice to extract that tooth with the hope of having some other tooth do as much good.

Another thing: I am in favour of saving the third molar, and I endeavour to remove that impression which a great many people have that the third molar is a poorer tooth than the others. It is an error, I think, to allow people to believe the third molar is a much inferior tooth to all of the others. Therefore I am always in favour of attempting to save and recommend the saving of the third molar.

Chic. So. Review.

British Journal of Dental Science.

LONDON, MARCH 1st, 1892.

THE NOISY ONES.

Comparisons are always odious. He, who, in private matters, calls himself great, and his neighbour small, is voted a braggart or a bumpkin, yet in public it seems a man may violate all the canons of self-respect in his self adulation, and yet we tolerate him. True, he will adopt a round-about phraseology—he will not tell you directly that he is the greatest dentist alive, but he will tell you he was a student at such and such a school,—he will dilate to you on the absolute superiority of this school, and gently hint he was not the worst student at that school. That a man should love his land, his home, and his school, is well. It is well that he should regard its good points with satisfaction, but he should not close his eyes to its failings. He should learn all there is to learn at home, but he should not rest here. As the great thinker, Goethe, let Wilhelm Meister follow his "Lehrjahre" spent in the home by "Wanderjahre" occupied by travels afar, so an ideal student would seek further knowledge in other lands, and at other schools. At Paris, at Vienna, at Berlin, the English Medical student seeks to extend his knowledge and experience, in the same way that Americans and others garner in what we have to teach in our schools at home. So with dental students, after learning what they can at home, they often go to other schools and learn much there. It is well it should be so, and none but the silliest of silly men, would ever dream of thinking that a student, in so doing, cast a slur on his school at home. If an English student, he remains an English student, who has but added a little to his knowledge, and if an American, he remains an American. As Englishmen, we are proud of our schools, but we hope we may not fall in the error of the braggadochio, and more especially, that we may never seek to elevate our-own schools by decrying others. If we err, may some kind friend check us. And as we hope we may not so sin ourselves, it is also our wish to credit others with the same intentions. From a variety of circumstances, but more especially on account of superior educational advantages, the United States and England have become, for the time, the chief teaching centres of Dental Surgery. Of England we know, and of the States, two interesting papers have recently appeared, the one pessimistic, the other optimistic, treating of the matter. From the first, that of Mr. Bentley, of Chicago, one rises with the impression, that whatever else the schools may be, they are directly antagonistic to the interests of the Profession at large. Why ? Because many have been started, not with the idea of teaching, but simply with that of making money. They, therefore, do not much care about the quality of the man they turn out, so long as there is quantity. And not only is the Profession overcrowded with inferior men, but the very schools themselves enter into competition with their own graduates, and this not on equal terms, for, whilst the graduate is debarred by professional etiquette from advertising, the school does so *ad lib.* For this state of things, he sees a remedy in State Examining Boards, an opinion, however, which meets with a direct negative from Dr. W. C. Barrett, in the second paper referred to, who is perfectly satisfied with the present condition of things. Just as on this point we have opinions utterly divergent, so on the question of American, and may be of English Schools. On the one hand, we have men crying themselves hoarse in self-adulation of American, and may be of English Dentistry, so on the other, we have men equally noisy in running down these very things. How is it possible to reconcile such opposite opinions ? Briefly, we think this may be done by seeking the opinions of the silent members of the Profession, of those men of sufficient strength of mind to notice the faults in that they hold most dear. As it is not fair to take a braggart at his own estimate, so, neither is it just to blame a Profession for the sins of the few, nor to think that the bulk of this profession have part or parcel in the quack methods and practises with which these few do their best to saddle the whole. True, it is difficult to ignore these noisy members, and far more so when distance prevents our hearing and seeing for ourselves that this verbage represents but a minority in councils and votes on professional matters. Still let us remember :—

"Bean-pods are noisiest when dry,
And you always wink with your weakest eye."

Ourselves as others see us.—"Mr.——— L.D.S. Engineer" is the way a French contemporary reads L.D.S., Eng., and who can wonder. Is this not a very good comment on the ceaseless multiplication of affixes.

We must, we regret to say, chronicle another death from toothache, and again directly due to the drug taken to relieve the pain. In the case of Dr. Eustace Bright, it was cocaine, this time it is Chloroform. An assistant to a chemist in Huddersfield, went to bed in good health and spirits, but with toothache, in the morning he is found dead, with a two ounce bottle half full of Chloroform in one hand. It seems he was one of those unhappy mortals, who suffer a great deal from toothache. Everyone knows such ; if poor and disregardful of appearances, they go about with the head tied up with flannel, or a handkerchief, or what not. If vanity forbids this homely comfort, they yet make their trouble known by their woe-begone look, their starts and calls at meals when something irritates their dental nerve, being not only miserable themselves, but usually doing their very best to make every one around them miserable also. Cure is at hand, but they will not have it. Why ?—Because the cure must need be by painful means seeing the patient, by neglect, has allowed the disease to advance too far for other means to be of use. No! they will nauseate themselves with patent nostrums, secret toothache cures; they will disturb their digestions by all sorts of tonics taken to cure "the Neuralgia," for they refuse to call it toothache. Finally, they poison themselves with cocaine, or chloroform, or some other pain-killer. Alas! we are in the wrong pulpit to preach from this text, but is it not stupid?

In dental work, the importance of good eye-sight cannot be over-estimated. It, therefore, becomes a question of importance as to what is, and what is not injurious to the eyes. We all of us know that an equally diffused light, such as is obtained from a north window on a clear day, is infinitely less fatiguing to the sight than any artificial light as yet introduced. As electric light became more generally used it was hoped that in this we might have a useful ally, when, from any cause, daylight could not be obtained, and it is pleasant to note that these hopes have been fully realized. Unhappily, some instances of damage to the sight, from the use of the electric light, having occurred, there has arisen some uncertainty as to whether its use is advisable or not. It is well, therefore, to note that Mr. Hartridge, of the Westminster Ophthalmic Hospital, sums up, in the *British Medical*, the use of the incandescent light, as possessing "advantages which no other illuminator can claim, and must be considered, when carefully shaded, and judiciously placed, as the best and most satisfactory form of artificial illumination." The chief points which lead him to this conclusion are, the absence of the products of combustion and the little heat given off by it; moreover, the following table, which he gives, of the result of some spectral analyses, show by comparison, a lower number of rays belonging to the red end of the spectrum, which are those most liable to irritate the retina.

	Red.	Green.	Blue.	Violet.
Sunlight	1.4	1.6	0.5	0.1
Electric Light	2.0	1.0	0.8	1.0
Paraffin	3.0	0.06	0.2	0.1
Gas ...	4.0	0.04	0.2	0.1

"All cases," of injury to the eyes, he says, "so far recorded as due to the electric light, have been produced by the arc, and then generally by gazing at the unprotected light in close proximity to the eyes." It seems to be the intensity of the light which is specially injurious, hence, Mr. Hartridge's advice to have even the incandescent light "carefully shaded"

An interesting case of the overgrowth of teeth of persistent growth is recorded by Dr. Brubacher in the *Deutche Monatsschrift*. As is well known the incisors of rodents are curved, the implanted portion being behind that which forms the crown, hence it follows that if the tooth grows abnormally long, it will more or less complete the circle of which the normal tooth forms a segment. In this animal, a white rat, the left Incisor had completed the circle, but not in the same plane, so that the point projected out at the side of the mouth. The right tooth formed two-thirds of a circle and was in one plane. The lower incisors were lengthened but less curved, as is, indeed, normally the case. Why this overgrowth was not checked by the normal wearing away at the cutting edges was not apparent none of the usual causes, such as absence of lower incisors, being present. Dr. Brubacher hazards the following very likely explanation. It is possible that the animal bit on some hard substance which twisted his tooth outwards and rendered it so tender that he could not bite on this tooth for some time. Meanwhile, the tooth increased in length as usual, and when the tenderness disappeared, it was too long to be brought into apposition with its opponent.

"That for ways that are dark,
And for tricks that are vain,
The " ad-ver-ti-ser " is peculiar."

An advertisement recently brought under our notice, runs thus :—" ———L.D.S., R.C.S.,———, Dental Surgeon, late of the Middlesex and Dental Hospitals, London."

Now, would anyone reading this, gather that the gentleman referred to was only a common, or garden, student at the above Hospitals? We will say nothing about the way the R.C.S. is added, for perhaps this is one of those diplomas which can not be regarded as a qualification? We do not know.

We note that the care of children's teeth was recently brought under the notice of the Board of the Central London School, by Mr. Pedley, and the appointment of a dental surgeon advocated. One of the members thought the communication a most extraordinary one. We must confess we fail to see anything extraordinary in it, save that the letter was sent by a member of the Profession in his private capacity, which is hardly desirable. Still the matter was referred to the House Committee, which, of course, may or may not be a polite way of dropping the matter. We hope not, and venture to think that if the matter was brought before individual members of such boards, by one of our recognized Societies, some good might result.

It is said that the Edinburgh Dental Hospital and School is about to be formed into a Limited Liability Company. Full details are not to hand, but such a step removes a school from among our public bodies, and so places it on the same footing as any other trade enterprise.

The well-known Firm of Messrs. Thomas Fletcher & Co., of Warrington, has been formed into a Limited Company. No doubt the Profession will avail themselves of the opportunity of taking shares in a sound concern, which promises, according to past records, to prove a very good investment.

Abstracts of British & Foreign Journals.

RESECTION OF LINGUAL NERVE FOR NEURALGIA.

Dubrueil, of Montpellier, reports (*Sem. Méd.*, January 16th, 1892) a case in which he cured neuralgia of the tongue by destruction of a portion of the lingual nerve with the thermo-cautery. The patient was a woman, aged 45, who four years before coming under observation had been suddenly attacked with acute pain in the side of the tongue. After two or three intervals of remission the pain became continuous in July, 1891. Several back teeth had been extracted from the lower jaw, in the belief that the inferior dental nerve was the one affected; and cocaine, antipyrin, and other drugs—including iodide of potassium and mercury, as there was a history of syphilis—had been tried, but all to no purpose. When the patient was admitted to the Hôspital St. Eloi, it was found that the seat of the pain was near the junction of the posterior third with the anterior two-thirds of the right edge of the tongue. It came on every five minutes, lasting several seconds with extreme intensity. The other branches of the trigeminal nerve were unaffected. Dubrueil determined to destroy a portion of the lingual nerve by the transmaxillary method, which he thinks preferable to the intrabuccal and submaxillary procedures. On November 30th, after thorough asepsis of the site of operation, he made a curved incision, with the convexity downwards, around the lower attachment of the masseter behind the facial artery. The muscular fibres were detached from the bone with the raspatory over the anterior two-thirds of the horizontal ramus. The trephine (Charrière's medium sized crown) was then applied, the instrument being used with the greatest care so as not to take up the nerve together with the bone. On raising the bony disc the nerve was found without difficulty, caught up on a strabismus hook, and divided with the thermo-cautery, the two ends being destroyed so as to make a gap in the nerve of about 1 centimetre in length. The inferior dental nerve was not seen during the operation, nor had any artery requiring ligature been cut; the bleeding was entirely venous and was easily stopped by pressure. A drainage tube was introduced deeply into the wound, the edges of which were then brought together with three carbolised silk sutures, and a dressing of aristol was applied. On the following day the patient complained of a good deal of pain in the right masseter, but the pain in the tongue had ceased. The wound healed in about a week, and the patient left the hospital on December 15th quite free from her neuralgia. For some days after the removal of the dressing she had had such difficulty in opening her mouth that Larry's gag had to be used before she could take food. Repeated testing showed that both tactile sensibility and the sense of taste had completely disappeared in the two anterior thirds of the right half of the tongue whilst remaining unimpared in the posterior third of the right and the whole of the left half. Moreover, the right side of the lower lip had lost its sensibility, a fact which Dubrueil attributes to his having unwittingly divided the inferior dental nerve with the trephine.

British Medical.

NOTE ON LIQUOR COCAINÆ HYDROCHLORATIS B.P.

By John Lothian.

I had occasion a short time ago to prepare a quantity of this solution. Following the official directions, "Boil the water, add the salicylic acid, and then the hydro-chlorate of cocaine; cool," I observed that a distinct aromatic odour of salicyl-methyl ester (oil of wintergreen) was given off. This would indicate that decomposition of the cocaine had taken place. Considering that hydrochlorate of cocaine is freely soluble in water it is difficult to see why it should be added to the boiling solution of salicylic acid. To obviate such a cause of decomposition I think it would be advantageous to have the directions amended as fotlows :—"Boil the water and add the salicylic acid, cool and add the hydrochlorate of cocaine."

Pharmaceutical Journal.

OBTAINING THE BITE.

Dr. W. Goodfellow, of Sussex, New Brunswick, writes us that a process which never fails to secure a correct bite in articulating artificial teeth, is to direct the patient to open the mouth and then to see that the tongue is placed firmly against the roof of the mouth, *well back*, and held there while closing it. In this position it is impossible to advance the lower jaw. *Dent. Advertiser.*

Neuralgia and Tic Pills.

Dried sulphate of iron	1 oz.
Sulphate of quinine	½ oz.
Gingerin	20 grains.
Hydrochlorate of morphine	40 grains.
Extract of henbane	1 oz.

Glycerine of tragacanth, a sufficiency.

Triturate the quinine and morphine with the dried sulphate of iron, then add the gingerin and the extract, using as much glycerine of tragacanth as will make a good mass.

The mass should be well beaten, so as to incorporate the ingredients thoroughly. Divide into 3-grain pills, and roll well in French chalk and starch. Thus finished the pills have a nice appearance.

Dose: one pill, morning, noon, and night, while the pain lasts. Two may be taken at bedtime, if necessary.

For Toothache.

Finest mastic	6 drachms
Extract of Indian hemp	1 oz.
Chloroform	2 „

Mix, and shake occasionally until dissolved.

Hydrochlorate of morphia	30 grains
Menthol	1 drachm
Chloral hydrate	2 drachms
Camphor	4 „
Oil of cajuput	2 „
Tincture of pellitory to	4 oz.

Mix, and shake occasionally until dissolved; then add the mastic solution, and filter. *Chemist & Druggist.*

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The Annual General and Ordinary Monthly Meeting, January 11th, 1892. Mr. Thomas Arnold Rogers, Hon. Treasurer, in the Chair.

The minutes of the preceding meeting having been read and confirmed,

The CHAIRMAN stated he had, with great regret, to announce that their President (Mr. Hutchinson) was prevented by illness from taking the Chair. Mr. Stocken, Mr. David Hepburn, and Mr. Harding (vice-Presidents) had each been appealed to to fill the place, but were prevented by like circumstances, so that he would ask their kind indulgence for himself.

Messrs. S. A. COXON and J. F. COLYER were appointed scrutators of the ballot for Officers, which was declared open.

The CHAIRMAN announced that Messrs. J. W. Seville (Exeter) and G. O. Whittaker (Manchester) having sent their Obligation Forms duly signed, these gentlemen were declared admitted.

Messrs. C. W. Croft Handley, L.D.S. Glasgow, The Elms, 15, High Street, Stoke Newington, W. (resident); Henry Ernest Goddard, L.D.S. Glasgow, Oxford Street, Nottingham (non-resident); and Wm. Draper Moon, L.D.S. Eng., 8 Jesmond Road, Newcastle-on-Tyne (non-resident), were balloted for and elected Members.

The following were nominated before the Society:—Thomas Henry Garland Wrighton, L.D.S. Eng., 7, Bloomsbury Square. W.C. (resident); Charles James Blaaberg, L.D.S. Eng., 2, Argyle Square, King's Cross, W.C. (resident); Arthur Reginald Colyer, L.R.C.P. Lond., M.R.C.S. and L.D.S. Eng., 66, Christchurch Road, Tulse Hill, S.W. (resident); Harry Arthur Forsyth, L.D.S. Eng., 54, Claverton Street, Pimlico (resident); Walter Stanley Holford, L.R.C.P. Lond., M.R.C.S. and L.D.S. Eng., 23, Wimpole Street, W. (resident); Edmund Balding, Jun., L.D.S. Eng., Fairbridge House, 732, Holloway Road, N. (resident); Percy L. Webster, L.R.C.P. Lond., M.R.C.S. and L.D.S. Eng., 2, Redesdale Terrace, Canfield Gardens, N.W. (resident); George Hern, L.R.C.P. Lond., M.R.C.S. and L.D.S. Eng., 18, Stratford Place, W. (resident); Francis Henry Ellwood, L.D.S. Ireland, Granville House, Redhill, Surrey, (non-resident); Robert Edward Waller, L.D.S. Eng., Cairo, Egypt (non-resident); Montague Frank Hopson, L.D.S. Eng., The Croft Newbury, Berks (non-resident).

The LIBRARIAN (Mr. Ashley Gibbings) being called upon for his Report, said: Since our last meeting I have received the *Philosophical Transactions of the Royal Society* containing a paper of Mr. Howard Mummery, entitled, "Some Points in the Structure and Development of Dentine," presented to the Society by the author. Very few books have been added to our library since the date of my last Annual Report. In January last we purchased three new works, but since that time we have been so uncertain as to the accommodation that the library will in future possess, that I have not considered it advisable to recommend any further purchases. Amongst those who have presented books I may mention Messrs. Ash & Sons, Mr. Worsley, and Mr. Trude Fripp, the latter of whom gave us six old books published in the early part of the present century, for which he received the special thanks of the Society through the President. I hope that during the ensuing year many other members will follow the example of these gentlemen, and that at the next Annual Meeting the Librarian may be able to report that the Library is more worthy even than at present, of the Odontological Society of Great Britain.

The CURATOR (Mr. Storer Bennett) said that he had little to add to what he had already said with regard to the various specimens, twenty seven in number, which he had fully described at the time of their presentation, but following the course which he adopted last year, and which seemed to give general satisfaction, he had brought down all the specimens which they had received during the past twelve months and placed them on the table with labels attached fully indicating what they were; he would specially draw attention to the skull of the mummy 4000 years old, which showed that the retention of the temporary teeth was not a condition at all peculiar to the present age.

The Treasurer then presented his Report.

The Reports were duly passed.

Mr. H. L. Albert narrated a case of asymmetry of the jaws:

Alice Barnes, *æt.* 28.—There was no history bearing on the case until two years ago, when she noticed some stiffness about the left temporo-maxillary joint. Just prior to this she had a tooth extracted and some artificial teeth put in. After the adaptation of the latter she noticed her mouth was drawn to one side. Since then the stiffness and deformity had markedly increased.

The infantile illnesses had been scarlet fever, and, to use her own words, "low fever"—the latter possibly being infantile paralysis, it occurring about the age of ten, and leaving her so utterly devoid of muscular power that she was unable to walk for six months without leaning on some one. There had been no injury, no rheumatism and no syphilis. No hereditary history.

The patient brought a photograph with her taken five years back. This showed some slight deformity. Patient was a well-formed young woman, with good features above the line of the upper lip, well nourished, healthy-looking. The examination of the upper limbs revealed no other asymmetry, and she wears the same sized boots. The face presented a most peculiar appearance, looking as if it had been made in two pieces, with the jaws stuck on at an angle of forty-five degrees, or, to use the words of an artist, if the head were placed in a frame, it would look like the early efforts of an art student. The two eyes were on different levels, but the difference was very slight, and apparently increased by the arching upwards of the left eyebrow. Under the left eye was a hard projection traceable to the ear, which was probably the bulging zygomatic arch; below this, and in front of the ear, was a hard, bony projection, in front of which was a depression, one could get one's finger into. These might be taken to be the hypertrophied condyle with the sigmoid notch correspondingly increased in size. The condyle extended downwards for 1½ in. The facial surface of the U. L. jaw was protruded, and on passing the finger into the mouth, the bulging alveolus became very evident, especially in the bicuspid and molar regions. The lower jaw was pushed over to the right side, so that the chin was one inch from the median line. A corresponding protrusion of the right lower jaw was seen, whilst the articulation of that side was less evident than usual. There was pain on opening the mouth wide, and impossibility of opening it wider than 1½ in. The line of the teeth, both artificial and real, was a line drawn from two inches above the right angle of jaw to the angle of the left lower jaw. No facial paralysis; and perfect power over limbs existed; she had suffered from toothache and swollen face at times in the left lower jaw. The teeth lost had been removed for these affections. There was some atrophy of the left masseter.

Measurements of face:

Root of nose to external angular process ...	R = L
External angular process to ear	R = L
Ear to ext. occipital protuberance	R = L
From ear to angle of jaw	L = 4 in.
From ear to angle of jaw	R = 3 ,,
From I. canthus to ear	L = 5 ,,
,, ,, ,, ...	R = 4⅛,,
From I. canthus to angle of jaw	L = 5 ,,
,, ,, ,, ,, ...	R = 5½,,
From symphysis to angle of jaw	R = L

The mouth was in a very unhealthy condition, crowded with diseased teeth and roots, most of the few sound teeth being loose, and pus secreted around them. The gums were congested and excreting viscid mucus in large quantities.

Owing to the difficulty in opening the mouth, Mr. Albert found it impossible to obtain satisfactory impressions, either with or without an anæsthetic.

Teeth removed:

Upper jaw—left side.

Third molar root.—Thickened.

Second molar root.—Thickened. and slightly carious.

First molar root.—Slightly carious; palatine root, one-third absorbed; buccal roots thickened and blended at the apices; the anterior buccal root was nodulated nearly as far down as the neck.

Second bicuspid root } —Thickened and irregularly ab-
First ,, ,, } sorbed.

Canine.—Crown perfectly sound; apex of root showed irregular absorption extending to the upper fourth at the posterior surface.

Lateral incisor } —Crown sound, slight absorption of
Central ,, } roots.

Right side.

Central incisor }
Lateral „ } —Same as left side.

Canine.—Same as left side.

First bicuspid.—Crown perfectly sound, root partially absorbed and considerably thickened at the apex. Roots beyond this, first, second and third molars, irregularly absorbed.

Lower jaw—left side.

Third molar root.—Thickened.

First molar root.—Thickened at apex.

Lateral incisor }
Central „ } —Normal.

Right side.

Lateral incisor }
Central „ } —Normal.

Canine.—Normal.

First bicuspid.—Crown sound, slight absorption at root.

Molar root.—Irregularly eroded.

Third molar root.—Slightly thickened, crown normal.

His colleague, Mr. Frost reported: "L. eye pushed forwards to 2 mm. and slightly raised." The actual diagnosis of the deformity was, to a certain extent only certain, for there was the hypertrophied condyle, but this was not enough to cause the protrusion of the malar bone, nor of the facial surface of the upper jaw, nor would it cause the even slight alteration of the level of the eye. Neither could these be accounted for on the supposition that the possible infantile paralysis had in some way retarded the growth on the right side and so a compensating hypertrophy on the left. Nor could it be imagined that in the adaptation of the teeth, an incorrect bite would throw the jaw over to one side, much less be attended by hypertrophies anywhere. There were but three conclusions possible, and one of these, general asymmetry, was disproved by measurements. The remaining were some antral growth or hypertrophic changes in the upper jaw, a sort of unilateral leontiasis ossium, involving a secondary and compensating change in the lower jaw.

The Chairman remarked that the case was interesting, and he hoped that it would lead to some discussion. As Mr.

Heath was present, than whom there was no better authority in cases of this kind, they should be glad to hear him on the subject.

Mr. CHRISTOPHER HEATH said that although he had come for another purpose, he had much pleasure in responding to the Chairman's invitation. The case belonged to a class of cases in which he took a great interest. He happened to have with him a copy of one of his own lectures given at the Royal College of Surgeons in 1887, and there they would see the picture of a girl with a deformity very similar in character to the one that had just been brought under their notice; it was a case of hypertrophy of the neck and condyle of the jaw, and Mr. Heath thought there could be no doubt, from the measurements given, that this was the disease that Mr. Albert's patient was suffering from. They had been told that there was a considerable difference (1 inch) between the ramuses of the jaw, and that the condyle of the jaw was considerably enlarged; that would be due to hypertrophy of the condyle. With all deference to Mr. Albert, he thought that relief could only be given by removing the condyle and portion of the jaw; he felt confident that no dental treatment could put the matter right. Mr. Heath drew attention to a drawing on the previous page of the lecture of a remarkable preparation in the London Hospital taken from a dead body; the jaw was examined, and then that very remarkable condition of the jaw was found to exist, there was hypertrophy of the condyle, and a very similar deformity as in his own case. Anyone could examine either of these cases in the Museum of the Royal College of Surgeons.

Mr. STORER BENNETT desired to ask if the teeth as well as the portrait were to be presented to the Museum. He might say with regard to the teeth, that although interesting as presenting a considerable amount of absorption, he did not think that they were responsible for the overgrowth on the left side, for the absorption might be seen on both sides, and he could not help thinking that the deformity had no connection with the condition of the teeth.

Mr. S. A. COXON wished to ask Mr. Albert what advantage he expected to derive from removing the lower incisors? They seemed all of them to be in fairly good condition.

Mr. ALBERT, in reply to Mr. Bennett, said that he should be very glad if the Society would accept both the teeth and portrait; he hoped that he did not seem to assert any connec tion between the absorption and the disease. In reply to Mr. Coxon, he said the removal of the lower incisors was the only way of getting access to the mouth.

Mr. J F. Colyer read a communication referring to three cases of fracture which illustrated the use of what is known as a Hayward splint.

The first case occurred in a boy, æt. about five, a patient of Mr. Smale's, who was seen at Westminster Hospital. He had fallen from a height of about twenty feet, and sustained a fracture through both canine regions. In addition, the lower lip was much cut, and when first seen four days after the accident, was extremely swollen, adding to the difficulty of the case. When examined under chloroform the fragment carrying the incisor teeth was displayed downwards and backwards, and could be with great difficulty replaced. The teeth were thin and very short. Impressions were taken and a loosely fitting splint made ; this was filled in with Gilbert's gutta-percha, and the splint forced into place (chloroform being administered). A fair amount of difficulty was met with in getting the fragment into place, but the case progressed without an untoward symptom, the splint being removed in five weeks.

The second occurred in a female æt. thirty-five, who during a strike meeting acquired a fracture in the left canine region. Attempts were made at first to treat this with an outside gutta-percha splint, but this proved insufficient to keep the fragments in position. When first seen by Mr. Colyer the larger fragment was very much displaced downwards, the bicuspids and incisors in the fragment being very short. In the molar region on either side the teeth were level with the gum. A splint was fixed in position and removed in five weeks, good union resulting, though the canine had to be removed, followed by exfoliation of a small portion of bone at this point.

The third case was that of a man who had been treated fruitlessly by an outside splint for fourteen days. Examination proved that the line of fracture ran in front of the right lower wisdom, the alveolus carrying the first and second molar being fractured and forced inwards. The displacement of the fracture carrying the wisdom tooth was well marked, being displaced upwards and inwards towards the median line. A splint was made and fixed, the patient progressing very well during the first three weeks, but during the fourth an abscess formed about the angle of the jaw. The splint was removed at the end of the fourth week, when good union had taken place.

In the first case the thinness, slight looseness of the teeth, and displacement of the central fragments, and in the second the shortness of the teeth and great displacement downwards of the larger fragment, contra-indicated a Hammond splint, as the tension on the teeth would have been prejudicial.

In the third case a slight addition was made to the splint. The tendency of the bandage in these splints was to slip forwards, and it was at times difficult to keep it in correct position. To overcome this, slight catches were soldered on the splints, one towards the front part of the outside bar, and one towards the extremity, this latter being useful for fixing or spicking on the bandage when pressure was required towards the back part of the jaw. In these splints it was as well, if there was the slightest doubt about getting the fragments back into perfect position, or if the teeth were at all pointed, to make them loosely fitting, and fill them with some soft form of gutta-percha. This overcame the difficulties mentioned, and ensured a perfect fit. Another point was to bend the bars upwards so as to prevent the wire rubbing the angles of the mouth, and it was always as well to moisten this part of the wire with some lubricant.

The splint had its advantages and disadvantages, the principal disadvantages urged against it being the discomfort to the patient when lying on the side, and the liability to cause eczema at the angles of the mouth. For these reasons many would prefer a Gunning's splint in the cases recorded. The advantages of a Hayward's splint when it could be used over a Gunning's were, firstly, that it allowed movement of the jaw, and hence more solid nourishment could be taken than with a Gunning, and again, the pressure from the bandage was more evenly distributed than was the case with the Gunning—a most important point.

The CHAIRMAN remarked that fractures of the jaw seemed much more common now than they used to be ; possibly it was due to the greater amount of machinery employed, and the greater number of accidents arising from it.

The SECRETARY, for Mr. A. C. Farnsworth, showed a new impression tray for rapid modelling. The tray had a hollow chamber and an inlet and outlet tube, the idea being to fill the chamber with cold water so that the impression might be cooled quickly.

Mr. WALTER H. COFFIN, without wishing to detract from the merits of the invention or the ingenuity of the inventor, said that he might be pardoned perhaps for mentioning that this form of tray, though neat and convenient, was by no means new; he remembered perfectly well an equivalent to this being used by his father twenty or thirty years ago.

Mr. CHRISTOPHER HEATH then read his paper on "Epethelioma of the Jaws," (see page 145.)

DISCUSSION.

The CHAIRMAN said that a more interesting communication it had not been his good fortune to listen to for a long time. Mr. Heath had put the matter so exceedingly clearly before them that they would be able to recognise the nature of these cases when they met with them. It was so many years since he (the Chairman) had practised that he did not feel capable of criticising the paper, but he had listened to it with the greatest pleasure.

Mr. STORER BENNETT would like just to endorse, as far as he might, the view of Mr. Heath as to the unsatisfactory results. when two halves of the jaw have been removed, obtained by any attempt to keep them separated by artificial means. Some 12 or 14 years ago one of his colleagues at the Middlesex Hospital had occasion to separate the jaw; he (Mr. Bennett) made an apparatus with two joints and pins for attaching to the side of the portion of the jaw from which the bone had been removed; this kept the two halves apart, and the divided portions were made to work one with the other. For a time it seemed satisfactory, but tho parts contracted to such a considerable extent that finally the whole thing had to be abandoned. He had seen similar cases from time to time, but that case came under his own personal treatment and observation, and he thought it would be the experience of most that the parts always contracted.

The CHAIRMAN remarked that Mr. Heath was now obliged to leave, but they would agree with him (the Chairman) that they could not allow him to do so without expressing their thanks for his very valuable paper.

A vote of thanks was carried by acclamation.

Mr. Heath desired to thank the members for their kind reception of his paper, which it had been a pleasure to him to give, and he was amply repaid if they had been interested.

The Chairman called upon the scrutators to report the result of the ballot, and he then declared the following officers duly elected for the year 1892 :—

President—J. Howard Mummery.

Vice-Presidents—Resident: David Hepburn, T. H. G. Harding, R. H. Woodhouse. Non-Resident : J. H. Redman (Brighton), R. T. Stack (Dublin), F. H. Balkwill (Plymouth).

Treasurer—Thomas Arnold Rogers.

Librarian—Ashley Gibbings.

Curator—Storer Bennett.

Editor of Transactions—Walter Coffin.

Honorary Secretaries—John Ackery (Council), W. A. Maggs (Society), F. Henri Weiss (Foreign Correspondence).

Councillors—Resident : W. Hern, F. Newland Pedley, C. J. Boyd Wallis, F. J. Bennett, Cornelius Robbins, E. G. Betts, Morton Smale, B. J. Bonnell, E. Lloyd Williams.

Non-Resident : W. B. Bacon (Tunbridge Wells), H. B. Mason (Exeter), Mordaunt A. de C. B. Stevens (Nice), T. S. Carter (Leeds), W. S. Woodburn (Glasgow), W. H. Williamson (Aberdeen), H. C. Quinby (Liverpool), D. W. Amoore (St. Leonards), Wilson Hogue (Bournemouth).

In the absence of the President, the Secretary read the valedictory address :—(see page 150).

After the reading of the President's Valedictory Address, the Chairman said :—

Gentlemen,—As in the absence of the President you have placed me in the chair, you will perhaps agree with me that it is but fitting that I should be your mouthpiece in proposing a cordial vote of thanks to him for the valuable services he has rendered to the Society during his year of office. It is a pleasant, and yet a painful duty to perform. I say painful, because we have to part with our President when we have learned thoroughly to appreciate his services, and at a time when those services would be most valuable. It was indeed the unanimous wish of the Council that Mr. Hutchinson should allow himself to be nominated for a second term. But he considered it right to decline—not from any desire to evade the burdens of his office but from a higher motive. I hope I shall be pardoned by him for telling you that his chief reason was his disinclination to stand in the way of those many members who may justly aspire to hold this office, which has been aptly styled the blue riband of our profession, and who are so fully qualified to hold it. I am sure we shall appreciate this generous sentiment, and honour him for it even more than if he had consented to our wishes. You will remember that last year we did not exercise the option of electing a non-resident President because of the coming meeting of the British Dental Association in London, and the consequent necessity for a resident chief. We all know how splendidly Mr. Hutchinson dispensed the hospitalities of our Society, and I would most respectfully add, how graciously he was aided by Mrs. Hutchinson. But we did not all know that he not only devoted very much time and thought to these duties, but that he generously contributed more than than three quarters of the expense. He wished, indeed, to defray the whole, but the Council decided otherwise. I think it due to him to mention this, which you would certainly never have learned from himself.

But a far more serious question arose for us last year—the question, and it is a very serious one—whether we may not have to leave our old quarters here and seek a home elsewhere. The matter is still under consideration ; but the search for new premises caused the President and the Secretaries incalculable trouble and anxiety. With some knowledge of the work of the Society from its beginning, I think Mr. Hutchinson's labours have been heavier than those of any President since its early days when it was in process of organisation, and in addition was engaged in working out the great educational movement whose results we are now enjoying.

I need scarcely allude to Mr. Hutchinson's conduct of our meetings since, both here and at the Council ; we have all seen his thorough mastery of the art of presiding, his knowledge of its duties, his promptitude in decision, his unfailing tact, his unvarying courtesy. Let us hope that his tenure of office has been as gratifying to himself as we know it has been beneficial to us. I have much pleasure in proposing our best thanks to him, and I wish he were present to hear the acclamations with which I am sure they will be accorded to him.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The last Ordinary Meeting of this Society, was held on Friday, 5th February, at 8 o'clock. W. Robinson Humby Esq., *President*, in the chair.

The minutes of the previous meeting were read by the Hon. Secretary, and confirmed.

The following gentlemen were present as visitors, and received the usual form of welcome from the President.—Messrs. Woolf, and Bradshaw.

The President read out the names of the following gentlemen, who were proposed for election as members. Messrs. Bradshaw, Reece, and Woolf.

CASUAL COMMUNICATIONS.

Mr. WOOLF presented a case of gemination, lower right lateral, and supernumary Incisor.

(2). A difficult case of extraction,—curved canine.

(3). A case of very large exostosis,—(lower molar).

Mr. H. CARTER showed a model, representing a case of two symetrical supernumary teeth in upper maxillary.

Mr. C. BASCOMBE showed a model, representing the lower jaw of a girl, about 15 years of age, with 3 supernumary teeth, so well developed, as to make it difficult to determine which were permanent, and which supernumerary.

Dr. MAUGHAN presented a case of phosphorus necrosis. He said, "the patient was 45 years of age. He began taking Phosphorus in the form of pills, at the age of 25. This he continued for 15 years. He then suffered from toothache in the right upper teeth, and neuralgia on the right side of the head. One by one, these teeth became carious, and dropped out, revealing extensive necrosis of the right superior maxilla. When the sequestrum was taken away, viz., 4th inst., it was found that the right nasal cavity communicated by a long slit with the mouth, externally, a process of new bone, covered with healthy granulations, passed downwards, preserving, to some extent, the natural appearance of the right cheek. This specimen illustrates very well the porous character, and dirty pumice stone colour of Phosphorus necrosis, contrasting it with the solid look and dead white colour of an ordinary necrosis, the difference being a striking one. The case is interesting, as supporting Langenbeck in his contention, that phosphorus necrosis may occur by transmission of the poison to the bone, by the blood, and not as most surgeons assert, by the *invariable* antecedent dental -- caries, or diseased jaw."

Mr. Rushton asked Dr. Maughan whether he considered phosphorus necrosis was the result of caries or abrasion of gums. or whether it was due to taking phosphorus internally.

Dr. Maughan replied, and said, that this case was clearly a case of transmission of the poison to the bone by the blood.

The President, Mr. Humby, pointed out, that twenty years ago, it would have been a favourite case for discussion, as then it was a question, how to prevent this terrible scourge of phosphorus poisoning.

He agreed with Dr. Maughan, that phosphorus poisoning was rather the result of phosphorus fumes entering blood and system, than by a broken off tooth.

This ending the Casual Communications, the President read his opening Address. (See page 201.)

The President then announced, that there was every prospect of a very successful year, for he had before him a list of names of those who had promised to read papers before the Society, such as had never been the case before, whereas, in former years, the difficulty had been to get anyone to promise to read papers, this year, they had a surplus of names, he therefore, put it to the meeting, that there should be an extra meeting convened in October, if found necessary. The proposition was carried unanimously.

The President then read out the names of the gentlemen, who had promised to contribute papers.

Mr. Woolf—"On porcelain faced crowns, with collar attachment" (Illustrated).

Mr. Nicholls—"Casualties of Extraction" (December).

Mr. Macfarlane—"Gold Crowns."

Mr. Farmer—"Obturators."

Mr. Ward—"Porcelain Inlays."

Mr. Myers—"Extraction of Teeth."

Messrs. C. Bascombe and Fisk had not yet decided as to what subject they should read.

The meeting was then adjourned till Friday, 4th March, when Mr. Woolf will read a paper, on "Porcelain faced crowns with collar attachment"

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

The Fourth Meeting of the Session was held on January 26th, the *President*, Mr. W. Simms, in the chair.

The minutes of the last general meeting were duly read and confirmed.

Mr. J. C. **Lingford** showed a model with 2 large supernumerary teeth, and a model sent by Mr. W. Fisher, showing a distinct supplemental lateral.

Mr. F. L. **Tanner**, *The Curator*, announced that he had received from Mr. G. G. Campion, the copy of Miller's work on the micro-organisms of the mouth, and a box for conveniently holding microscopic slides.

Mr. D. **Headridge** proposed that the best thanks of the Society be given to Mr. G. G. Campion for his gifts, and to Mr. P. A. Linnell for the framed photograph of some of the past Students, which he had presented.

Mr. F. L. **Tanner** in seconding this motion, said that he would be glad, as Curator, to receive any micro-slides, for the Society's Museum.

Mr. A. L. **Bostock** was then called upon to read his paper on "Dental Histology." (See page 194.)

Mr. D. **Headridge** in opening the discussion, agreed as to the importance of the subject, and regretted that at the College Practical class, too much general, and too little Dental and Comparative Histology was given, so far as Dental Students were concerned. He suggested as Text-books, Stirling's or Foster's Practical Histology. He also explained, and exhibited, Cathcart's Freezing Microtome.

Mr. F. L. **Tanner** considered that the new regulations, now insisted upon, would considerably interfere with Hospital work, and thought that instead of the usual Practical Histology course, it would have been better to have substituted a short course on Dental Histology. He suggested as a better decalcifying fluid, Glycerine, with a small amount of Acetic Acid, but admitted its action to be slow, taking two years. He mentioned, that at the Dental Examination, candidates now were expected to identify microscopic specimens of tissues.

Mr. P. A. **Linnell** said, he thought that Cole's work on Histology, was a small, but useful guide. He agreed with

Mr. Tanner, as to the little use of the course of Histology given at the College, and thought that special courses, such as were given at Guy's and Birmingham Hospitals, were of much more value to the Dental Student. He suggested that Mr. Bostock should give a practical demonstration before the Society.

Mr. F. W. Minshall mentioned a method of obtaining sections, which did away with the use of paraffin or freezing.

Mr. A. B. Sibson also suggested that a practical demonstration be given by Mr. Bostock, and suggested that a special meeting be held before the Summer Session.

Mr. J. C. Lingford, the Secretary, proposed that the members should empower him to call a meeting for this purpose in April next. Mr. W. R. Burkett, seconded this.

Mr. W. Simms, in closing the discussion, said that the subject was one of importance to the younger dentists, as researches were open to them, that would give them a prominent position in the Profession. He certainly thought that a special Dental course ought to be introduced at the College, and said it was a question now, how to crowd into two years, the necessary lectures, and study. He believed, that it would mean, reducing the mechanical work to two years, and increasing the Hospital work to three years. He thanked Mr. Bostock, on behalf of the Society, for his paper.

Mr. Bostock then briefly replied, and promised to give the suggested practical demonstration in April, and to contribute slides as a nucleus, towards a collection for the Society.

The meeting was then brought to a conclusion.

Lip Salve.

Ol. amygd. dulc.	℥viij.
Ceræ albæ	℥ij.
Cetacei	℥j.
Rad. anchusæ	ʒvj.
Ol. macis express (must be fresh)	ʒiv.
Otto rosæ	ʒss.

Melt the first three ingredients and the oil of mace, and add the alkanet root. Continue the heat until the alkanet-root is thoroughly exhausted—that is, when a good dark colour is obtained; then strain, and, when nearly cold, add otto.

Chemist and Druggist.

Dental News.

GLASGOW DENTAL HOSPITAL.

The annual meeting of the subscribers to the Glasgow Dental Hospital was held in the Religious Institution Rooms on the 3rd inst, Lord Dean of Guild Guthrie Smith presiding.

The Secretary (Mr. D. M. Alexander) submitted the seventh annual report. In this it was stated that since the institution of the hospital no fewer than 37,879 cases had been treated. During the past year the number had been 4381. Of these 3258 had been treated by extraction, while 1125 had been cured by preservation. The hope expressed by the directors in their last report that the hospital might be free from debt in the course of the twelvemonth had been realised. After making provision for all outstanding accounts, there was a credit balance of £8 11s. 10d. This, however, was not owing to any increase in the amount of the public subscriptions, which remained the same as last year, but to the number of students who had availed themselves of the training offered by the hospital. The contributions from the public had been £108, while the whole expenses attending the work was £159.

The Chairman in moving the adoption of the report, said that it showed that the hospital continued to do good work. The figures pointed to a great deal of suffering alleviated. The hospital did not enjoy the sympathy of the public in the same measure as many other hospitals, for the reason that fatal results very seldom or never followed disease of the teeth. While this was true, there was no thorn in the flesh more severe than an aching tooth. Bad teeth tended very much to dyspepsia, indigestion, and bad health. In diminishing these evils he was sure the hospital was exceedingly useful He did not see why the public should not extend to the Dental Hospital the same sympathy that it did to any of the other larger hospitals in the city. It was gratifying to find that there was a credit balance, on account of the manner in which students had patronised the hospital. The fact that they were doing so, and apparently found that they were getting valuable instruction, was a very great argument in favour of the usefulness of the hospital.

Mr. Cameron Corbett, M.P., seconded. He said that an immense amount of good work was done in proportion to the money spent. He could not help feeling that the alleviation of suffering which was represented by the 4000 cases that had been treated constituted a very large return. He agreed with the chairman that it was an important testimony to the efficiency of the hospital that students should come and pay fees to have the opportunity of hearing what the hospital had to teach. But at the same time he could not help feeling that this was a somewhat precarious source of income. It varied from year to year. He thought it would be a very great advantage if the public would put the institution on a footing which would prevent it from being dependent on the students from year to year. He would like to see the time come when the whole £159 would be willingly contributed by the public. The directors had a right to expect that they would be relieved of all anxiety, and he felt that the public would only be doing their duty by supporting an institution which had proved so efficient and valuable in the public interest.

The report was adopted. Office-bearers were appointed, and the proceedings terminated.

LIVERPOOL DENTAL HOSPITAL.

The thirty-first annual meeting of the subscribers and friends of this institution was held Jan. 28 at the Town Hall. The Mayor, Mr. J. de Bels Adam, presided, and there was a good attendance, including Alderman Grindley, Dr. Waite, Messrs. G. Wynne, C. Birchall, A. Ralph, H. E. Brakell, J. R. R. Scott, J. Wannop, T. Mansell, R. Edwards, W. L. Jackson, &c.

The committee in their report, which was read by Mr. Jackson, the honorary secretary, stated that the total number of patients admitted since the formation of the hospital amounted to 282,181. During the past year the number of patients treated at the hospital had been 15,769, and of operations 21,371. The committee recorded with thanks a donation of £5 from the Earl of Derby, the president of the institution, and one of £7 7s. 2d. by Mr. J. Wannop, to liquidate the balance of the "Brakell Memorial Fund;" also a donation of £5 5s. from A. A., per Mr. L. S. Osborne, and others of smaller amount. The committee regretted the resignation of the honorary treasurer, Mr. J. Wannop, to whom their thanks were due for his past services ; and they also recorded their sympathy with their chairman, Sir James Poole, on his late serious illness, and trusted that his health would be re-established by his journey to India. The "Quinby Students' Prizes," to the best and next best operators for the past year, have been awarded to Mr. Woods and Mr. Byrne respectively, and the "Ash Annual Prize," for the best surgical paper by a student, to Mr. Edwards. The patients' voluntary contributions amounted during the past year to £65 15s. 11d. The committee had to regret the loss of old subscribers from death and other causes, and anxiously hoped that the usual place occupied by the hospital among the charities belonging to the city would so commend it to the philanthropic that the institution might not suffer by a diminished annual subscription list. The thanks of the committee of the Hospital Sunday Fund for their contributions, and to the medical, surgical and dental staff for their valuable services during the past year. The financial statement, submitted by Mr. Scott, the honorary treasurer, showed a total expenditure of £342 16s. 2d. and a debit balance of £18 8s. 5d. The receipts included annual subscriptions, £138 12s. : donations, £13 4s. ; students' fees, £52 17s ; and patients' contributions, £65 15s.

The Mayor, in moving that the report and statement of accounts be adopted, printed, and circulated, said he was quite surprised that such a useful institution should have such poor support from the general public. The total sum expended (£342) seemed to him a very small amount indeed, looking at the great good done by the institution, 15,769 patients having been treated during the year ; and he hoped the public would come forward and contribute more generously to its funds. (Hear, hear.)

Dr. Waite, in seconding the motion, said he was very glad the Mayor had called attention to the remarkably small total expenditure in proportion to the large number of cases treated. When they thought of 21,000 operations being performed at the hospital, the expenditure seemed ridiculous The fact was that the committee had from the first exercised the strictest economy, and had rigidly avoided anything in the shape of an obligation which they did not see their way to discharge. In order to place the hospital on a proper footing, however, and to provide it with all the appliances requisite for a dental surgery, an income of £500 a year was required, and he thought the institution had a very good claim on the public for that amount. (Hear, hear.) Not only was a large amount of good done in the way of saving teeth, and they all knew how much better that was than extracting them when they were aching. There were 15 students in the School of Dental Surgery connected with the hospital; it was affiliated with the University, and the prospects for the future were exceedingly encouraging. He had no doubt that, in the course of a few years, the school would be quite equal to any in the United Kingdom. (Applause).

The report was unanimously adopted, after which the usual votes of thanks were passed, and the committee officers, and staff for the ensuing year were appointed.

Mr Mansell, in introducing the two students who had obtained the Quinby prizes, explained that in the autumn of 1890, Mr. Henry Quinby generously placed at the disposal of the medical staff £20 annually for five years, to be competed for by the students, the amount to be divided into two prizes of £12 and £8. After considerable deliberation the staff of the hospital decided upon a course of examination which should be thorough and practical, and test the capabilities of the students to the utmost. Having given details of the examination, showing that it was of the most exacting and exhaustive character, he said that as one of the examiners, he should like to bear testimony to the skill and ability displayed by the students generally, and especially to the excellent work done by the prize-winners: and when he told the meeting that these young gentlemen were both first year men, he thought it would be agreed that they were deserving of the highest praise. (Applause.) He hoped that they would continue in their future life to work as well as they had done, and if they did so he thought he could safely promise them a very high position in the ranks of their profession. (Applause.)

The Mayor, in presenting the prizes—in each case a microscope—said he was quite sure it only lay with the recipients for their future to be a very bright one in the profession which they had chosen; and he was quite sure, from what he had been told, that their determination was to go on in the way in which they had begun.

Mr. Birchall said he was pleased to state that Mr. Woods, the winner of the first prize was a Wallasey Grammar School pupil. (Hear, hear.)

Dr. Waite said that, in addition to the two prizes just presented, a prize was offered by Mr. Ash, of London, for the best paper on the subject of alveolar hæmorrhage. Cases of violent hæmorrhage sometimes, though fortunately rarely, followed the extraction of a tooth, and when he told them that that hæmorrhage was sometimes of a very dangerous character they would see the importance of the subject which had to be treated. There were seven papers sent in, and, it having fallen to his lot to examine them, he was very glad to bear testimony to their general excellence. The one which took the prize excelled all others, perhaps not so much in its technical knowledge as in the clearer and more graceful style in which it was submitted. He then introduced Mr. Edwards, to whom the Mayor, with a few words of encouragement, handed the prize, consisting of a handsome cabinet.

Alderman Grindley, in moving a vote of thanks to the Mayor, remarked that since his worship had occupied his high and distinguished position he had shed a lustre on the civic chair that had not been excelled by any of his predecessors. (Hear, hear.)

Mr. Wynne, who seconded the motion, said that the cheerfulness with which the Mayor placed his time and his energies at the service of the charities of the town placed all who were associated with their management under a lasting debt of gratitude to him. (Applause.)

The Mayor, in reply, said it was very gratifying indeed to him to know that he was pleasing everybody in the discharge of the duties he undertook last November, and if any words he might utter with regard to any institution bore fruit he was delighted that he had had the opportunity of saying them. (Applause.)

The proceedings then terminated.

THE VICTORIA DENTAL HOSPITAL OF MANCHESTER.

The annual general meeting of the governors of the Victoria Dental Hospital of Manchester was held in the board-room of the hospital, Grosvenor Street, Charlton-on-Medlock, Mr. S. L. Helm presiding.

The Committee of Management in their eighth annual report, which was read by Mr. T. North, stated that notwithstanding the difficulties attendant on the limited accommodation afforded by the present building, the number of patients treated during the past 12 months reached the large figure of 12,072. The total number of patients attended to since the opening of the hospital was 83,498. The committee desired to call the attention of the inhabitants of Manchester to the ever-increasing demands made on them by the rapidly extending requirements both of the Hospital and the School of Dentistry attached thereto. The committee had for some time past been anxiously endeavouring to procure a site suitable for the erection of a new hospital. A site has now been obtained, mainly through the munificence of the trustees of the late Mr. Procter, and the committee urged upon the general public the necessity of according them a generous support in carrying out the long cherished idea of building the hospital and school on a scale commensurate with the requirements of the present advanced and increasing demands of dental science. All the funds at present available had been exhausted on the purchase of the site, and the committee therefore earnestly hoped that the further much needed assistance would be forthcoming to enable a suitable building to be erected. The honorary treasurer, Mr. F. W. Travers, National Provincal Bank, Manchester, would be happy to receive donations towards the building fund.

The Dental Committee in reporting on the work of the past year, noticed with pleasure the fact that although there had been a slight decrease in the total number of cases treated, there had been a considerable increase in the conservative operations over those of the previous year. The chief value of the hospital to the poor consisted in its being able to afford them the means of preserving and making useful for mastication teeth which otherwise would be lost, and it was in these operations that the increase had taken place. There had been a slight decrease in the extractions, the chief diminution being in the less important part of the work included under the head of irregularities and advice cases. In its report two years ago the Dental Committee expressed the belief that the work of the hospital had reached the limit of the accommodation provided for it, and the comparatively small increase in the last two years tended to prove the correctness of this statement, and to show the necessity for a larger and more efficient building if the poor of this populous district were to derive the full benefits which should be placed within their reach by such an institution.

The following was a summary of the work for 1891:—Children, 5,682; adults, 6,390; total, 12,072. Extractions, 7,624; extractions under anæsthetics, 1,751; gold fillings, 810; other fillings, 2,173; irregularities, 498; crowns, 28; miscellaneous advice cases, &c., 2,872; total, 15,845. Average morning attendance, over 18; average evening attendance, 43. The hospital was open 306 mornings and 148 evenings; total, 454.

The treasurer's statement showed that the income for the year (including a balance in hand at the commencement) amounted to £350; and after payment of expenses there remained a balance in hand of £7 11s. 5d.

The Chairman, in moving the adoption of the reports and the treasurer's statement, said it was gratifying to find that the institution had done so much useful work during the year. The hospital had a twofold object. It was intended to benefit the poor, and also to educate students for the profession. He hoped that ere long they would have a new building more suitable for the work they were carrying on.

Mr. W. A. Copinger seconded the resolution, and it was carried.

Mr. Campion moved, "That Messrs. A. Boyd, W. A. Copinger, J. F. Schunck, J. C. Waterhouse, and G. W. Wilson be and are hereby re-elected members of the Committee of Management; and that Mr. F. W. Travers be and is hereby re-elected honorary treasurer; that Mr. Gray be and is hereby elected honorary secretary; and that Mr. Herbert Kidson be and is hereby re-elected honorary auditor."

Mr. Reuben Spencer, in seconding the motion said he was quite sure that if the public had any idea of the nature and extent of the work of that hospital it would receive a much larger share of their approbation. There was so much suffering among the poor and those just a strata above the poorer classes, that if the more well-to-do classes would only take the trouble to go there or inquire into the matter, their sympathy would be widely extended and the board would not have to appeal long before they received all the financial help they needed to enable them fully carry out their desires. The resolution was carried.

On the motion of Mr. Headridge, seconded by Mr. Linnell, the thanks of the board were passed to the members of the Committee of Management, to the members of the hospital staff, to the honorary treasurer, to the honorary secretary, and to the honorary auditor, for their services during the past year.

A vote of thanks to the chairman concluded the meeting.

BRIGHTON DENTAL HOSPITAL.

The Annual General Meeting of governors and subscribers of the Brighton, Hove, and Preston Dental Hospital was held January 29th, in the Board-room, Queen's-road, Brighton. There were present Dr. W. Harrison, Mr. C. A. Fox, Mr. J. Wood (Treasurer,) Mr. J. Wells, Mr. F. W. Carter, Mr. J. R. Gwatkin (Hon. Secretary), and Dr. C. B. Stoner.—Mr. Fox was appointed to the chair, in the unavoidable absence of the Major (Alderman Dr. Ewart).

THE ANNUAL REPORT.

The HON. SECRETARY read the annual Report of the Committee of Management, which described the present position of the hospital as a most encouraging one. They had the gratification of reporting that whilst the number of persons suffering from the various diseases embraced in dental surgery had been in excess of the number relieved in any former year, the financial support given had enabled the debt upon the Institution to be reduced. Two important facts were thus made apparent—1, that the benefits conferred by the Hospital were appreciated by those for whom it was founded ; and (2) that whilst its existence was becoming better known, its importance was more fully realised by the benevolent portion of the community. The Committee, however, could not refrain from remarking that the charity deserved still greater support especially from the county, inasmuch as the Hospital, although bearing only a local name, was open to all deserving cases coming from beyond the boundaries of Brighton, Hove, and Preston. And the Committee wished this important point to be borne in mind—it was the only Institution of the kind south of London. Besides appealing for increased support from outside the Parliamentary borough of Brighton, they could not help pointing to the very small amount of assistance received from the source known as "Workmen's Boxes," notwithstanding that a very large proportion of cases treated were furnished by working men and their families. The extent and importance of the work done during the past year was shewn by the fact that there had been an increase of 84 patients over the number admitted in 1890; and it was pleasing to note that that increase had been gradual, the numbers at the end of each quarter respectively being 654, 667, 677, and 703, shewing a total of 2,701, as against 2,617 in the previous year. Of the patients, over 1,000 were children, and of the total of 2,701, there were 1,062 males and 1,639 females. The total number of extractions amounted to 2,541, this large number being chiefly due to the want of timely care on the part of the patients themselves or of those having the guardianship of them. This was made more apparent by the fact that in 288 cases anæsthetics had to be administered in order to perform the operations, and no fewer than 755 teeth were removed under their influence. The percentage of fillings were thus necessarily small; still the number of teeth stopped amounted to 292, whilst over 600 cases came under the head of "miscellaneous," a class embodying some of the most important operations, such as attending to cleft palates, the removal of epulis, and amongst other things the regulating of dental deformities in children whose teeth in very numerous instances would continue to be sadly neglected but for the gratuitous services of the medical staff of the Dental Hospital. The Committee tendered their sincere thanks to all who had assisted in the work, individually to the several subscribers and collectively to the organisers of the Hospital Saturday and Sunday funds; also to Mr. A. Buckwolde Stoner for the proceeds of a concert which he gave in aid of the Institution. The Committee further recorded their indebtedness to Mr. D. E. Caush, L.D.S.; Dr. W. Harrison, L.D.S.; Mr. S. P. Johnson, L.D.S.; Mr. E. L. Norris, L.D.S.; Mr. C. E. Peckover, L.D.S.; Mr. S. Reed, L.D.S.; Dr. C. B. Stoner, L.D.S.; and Mr. A. B. Stoner, L.D.S., for their honorary, but valuable, services; and their gratitude to Mr. W. J. Stephens, L.R.C.P., who, except on very few occasions, had been in daily attendance as surgeon administrator of anæsthetics. Thanks were also due to the Hon. Treasurer (Mr. John Wood), the Hon. Secretary (Mr. J. R. G. Watkin), and the Hon. Solicitor (Mr. F. J. Bevis) for the help which they had afforded in their several capacities.—The Treasurer (Mr. Wood) presented the Balance-sheet. The total receipts during the year was £157 3s. 7½d., including items of £61 12s. 6d., subscriptions and donations; Hospital Saturday fund, £25; and Sunday fund, £10. The expenditure amounted to £141 12s. 7½d., leaving a balance to the good of £15 11s. At the commencement of the year there was a sum of £16 6s. due on the building debt, and this had now been reduced to £5 13s. 6d. Mr. Wood said he regarded this statement as a very satisfactory one, and as a proof that the Institution was going ahead.

On the motion of Dr. Stoner, seconded by Dr. Harrison, the Committee of Management was re-elected as follow ; The Rev. T. Rhys Evans, Messrs. F. W. Carter, T. Sundius Smith, D. Thomas, J. Tucknott, A. Upton, and J. Wells.

LEGAL INTELLIGENCE.

(Before Mr. Justice Grantham and a common Jury.)

MARSTON V. GLINDON.

This action was brought by a dentist's assistant, to recover damages for breach of contract in his being wrongfully dismissed from the defendant's employment, and for detention of household furniture, &c., after the dismissal.

Mr. Lawson Walton, Q.C., and Mr. Sinclair Cox, were counsel for the plaintiff ; Mr. Horne Payne, Q.C., and Mr. L. G. Pike for the defendant.

The plaintiff said he had entered the defendant's employment in 1885, as a dentist's assistant, his salary commencing at 22s. a week, which was gradually raised to 30s. in 1889. In February of the following year, a friend of his in Leicester offered him a partnership in a dentist's business there, on the strength of which he gave the defendant notice, but said he would stay for three or six months before leaving. The defendant begged that he would not leave him, as patients always objected to fresh faces, and accordingly, on his promising to raise his salary to 40s. a week, giving him 5 per cent. commission on all the patients he attended to, and allowing him to live in another house (the defendant had taken) rent free, he wrote to his friend in Leicester declining the offer. Previous to his marriage in June, 1890, he saw the defendant in reference to his position, and asked how much notice he would be entitled to, on which the defendant replied, that if anything cropped up between them he would give him six months' notice. Everything went well till March 20 of last year when, according to the plaintiff, chiefly in consequence of his refusing to sign an agreement binding him to serve the defendant, under disadvantageous circumstances for five years, the defendant there and then gave him a week's notice, and told him to get out of the house by the following Tuesday. The next day the plaintiff called on the defendant at his private residence, and told him his wife was expecting her confinement in a day or two, to which he replied, that he would not have her confined in his house. On the Tuesday, the plaintiff sent his wife to stay the night at a friend's, who had only a small sitting-room to spare, expecting to have the furniture removed the following day to some fresh apartments, but when he returned on the Wednesday to get his furniture, bed linen, &c., he found the house locked, and he was unable to get in. The result was, that his wife had to remain where she was, in the temporary bedroom, and was confined the following Saturday on a temporary bed.

In cross-examination, he said he had never heard that the defendant had put his coat on by mistake, and found in one of the pockets, two moulds, belonging to the defendent, for making artificial teeth. The defendant had told him he had found letters in his box which he thought would justify his prosecuting him for libel. He denied that he had promised to give the defendant a written apology for his conduct.

The plaintiff's wife and one or two other witnesses were called to corroborate his evidence.

The defendant, who was then called, said he had engaged the plaintiff in 1885 as an "improver," which meant that he had to be on the premises and do all the dirty work that a dentist required. In 1887 he raised him to an assistant's place. When he found the moulds by mistake in plaintiff's coat pocket he called him a thief, said he would lock him up, told him to take a week's notice, and "clear off." When looking for dental tools in the plaintiff's box, he found the letters referred to, and seeing his name mentioned he read them.

By the JUDGE.—You cannot well have seen your name till after you had read the letters.

When he told the plaintiff to clear out, he asked for forgiveness, and said he was very sorry for any wrong he had done the defendant. When the plaintiff called on the Wednesday night with his brother and his brother-in-law, the defendant said he called in a policeman, because he was afraid of their menacing behaviour, and when the plaintiff shouted out on leaving that he (the defendant), would have to pay for it, he (the defendant) told the policeman to make a note of what he said. (Laughter.)

Cross-examined.—It was in consequence of finding the letters, and subsequently finding the plaintiff had misappropriated some of his dental moulds, that he determined to give him a week's notice. He was sick of the man, and could not bear his sight; he would not have kept that man even if he had paid him £1,000 a week.

By the JUDGE.—My solicitor drew the agreement I suggested we should both sign; I believe I must have struck out of the draft, after the plaintiff had seen it, all mention of 5 per cent. commission and holidays, and have altered three into one month's notice, although why or when I altered the agreement I do not know.

An assistant to a dental manufacturing company limited, gave evidence that, in his opinion, so far as dental assistants were concerned, where weekly payment was given, then also a week's notice was sufficient.

Other witnesses were called, who said there was no fixed custom.

Mr. Justice Grantham having summed up,

The Jury retired to consider their verdict, and after half an hour's absence, they returned into Court with a verdict for the plaintiff, with £80 for wrongful dismissal, and £60 for detention of goods.

APPOINTMENT.

Wm. H. Dolamore, L.R.C.P., Lond., M.R.C.S., L.D.S, Eng., late Demonstrator, has been appointed Medical Tutor to the London School of Dental Surgery, *vice* Mr. C. Baldwin, resigned.

The publishers of the *Dental Advertiser* call our attention to the fact that the copies *are* stitched. The one we received unstitched, and on which we commented, was due to an oversight.

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ON "PORCELAIN FACED CROWNS WITH COLLAR ATTACHMENT."*

By Michael Y. Woolf, L.D.S.Eng.

Mr. President and Gentlemen :—

I cannot show a better appreciation of the honour which you have conferred on me in asking me to read a paper before you this evening, than, an endeavour to enter upon the discussion of a subject, with which we are all more or less acquainted, and the consideration of which cannot fail at any time to be of great practical utility. In this endeavour it will not be my aim to present to you an exhausting consideration of the subject which I have chosen for this discussion. I shall rather strive to lay before you a few practical ideas and show some practical inventions inseparably bound up with and markedly illustrating later day developments of the art and science of dentistry.

Before showing you any of the special instruments about which I intend to speak, let me preface all I have to say with this word of advice ; there is no need for any of us to possess all these instruments to be successful dentists, but they are illustrative of the methods and results of recent progress, and as such cannot fail to be of profound interest to us.

There are certain general principles which should be taken into consideration before deciding upon the advisability of crowning a root. The questions we must put ourselves are : firstly, whether the roots are fully calcified ; secondly, whether the space occasioned by the loss of the tooth will gradually be filled up by the approximation of the adjoining teeth ; thirdly, the value of the root in articulation ; fourthly, consideration of the general condition of the mouth; and finally, is the root in a thoroughly healthy condition?

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* Delivered before the Students' Society, National Dental Hospital.

I have heard it said, gentlemen, that there are practitioners amongst us who will start the operation of crowning a root, *before thoroughly attending to the most necessary and indispensable preliminaries, as stopping and scaling the teeth. This I utterly refuse* to be *believe.*

I maintain, gentlemen, this is a most important point, for in the face of much temptation we are liable to be led away from a true consciousness of purpose, which should be characteristic of all our actions.

Those who shrink at the bare idea of treating a dead tooth, and who, by continually adopting a system which will not necessitate the seeming *drudgery* of opening up and thoroughly clearing out the root canals, seek to hide their antipathies, may well let such work alone, for there cannot be a doubt that the value of Modern Crown Work depends entirely upon the success of root filling.

Before entering upon the details of the *modus agendi*, I intend to say a few words in reference to the necessary shaping of molar, and bicuspid teeth, for the reception of the artificial crown. When shaping natural roots or crowns, for any style of artificial crown with a collar attachment, it is necessary that the sides be made almost parallel with each other, the circumference of the neck slightly exceeding that of the free border, and the surface freed of all sharp edges or bulgings between these points, so that every facility is afforded to the band slipping into its proper position.

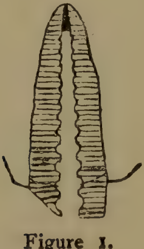

Figure 1.

The importance of preparing the root in the above mentioned manner cannot be overrated, and neglect in this direction, is no doubt one of the principal causes of failure.

Now, in order to accomplish successfully this shaping of the root, it is essential that a certain amount of the enamel encasing the neck of the tooth should be removed. This can be affected, in the majority of cases, by different forms of corundum wheels, but when these are contra-indicated, it is necessary to fall back on certain instruments devised for this special purpose.

As time will not permit of my attempting any detailed description of this process, I will pass round several of these instruments that you may inspect them for yourselves, and I shall heartily welcome any general opinion upon their merits, as these merits appear to you.

Let us assume here that the roots have been rendered perfectly healthy, and that the apices have been properly filled.

It is considered advisable to measure the length of the root. previous to filling, by passing a delicate broach up the canal as far as the apex. Thus the operator is enabled to measure the distance from the apex, to the point to which the canal should be filled, and also guage the depth to which the drill may be carried. The root canals should now be further enlarged if necessary, and the walls roughened to afford agreater hold to the cement on finally inserting the crown.

Although this part of the operation, when confined to the incisive region, is more or less easily performed, yet as we proceed towards the back of the mouth, difficulties are often encountered. No doubt, many of you, at some time or other, have been unfortunate enough to break off the head of a Gates-Gliddon drill in clearing out nerve canals in molar and bicuspid teeth. On this point, the President has given us some very valuable advice. He maintains that this misfortune, although often attributed to carelessness on the part of the operator, is in reality, due to the corkscrew formation given to the head of the instrument, which enables the point to travel only in one direction ; but should the engine by any mischance be revolved in the opposite direction, then the liability of the drill breaking at the neck, is greatly increased. To overcome this disadvantage, the President has devised a drill differing from the ordinary Gates-Gliddon, in that the cuts on the point run parallel with the axis. (Fig. 2.)

Another instrument which I now pass round is one which he uses for roughing the walls of the root canals. It will be observed that the cuts on the neck of the instrument are larger than those at its extremity, thus preventing that unnecessary

Having taken the measurement of the neck of the root with weakening of the structure which would otherwise be produced. (See Fig. 1).

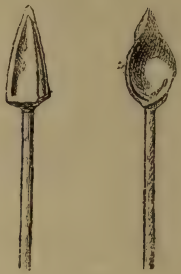

Fig 2.

In preparing the crown surface of the root, it is advisable to leave the lingual surface moderately high, while the buccal surface should be trimmed down slightly below the gum, to enable the artificial tooth to be adjusted to the contour line. The upper surface of the root will present two flat planes, joined in the rough form of an obtuse angle. This method of preparing the root, prevents any possibility of lateral rotation as well as affording a more reliable foundation for the artificial crown. (See Fig. 1)

When it is necessary to expose the cervical portion of a crown, which either by decay or by fracture, has been broken down below the cervical margin, the gum should be forced away by inserting a piece of gutta-percha in the remaining portion of the root, which should be allowed to remain there for a day or two.

Mr. Evans suggests that when decay extends above that exposed surface which is to be covered by the band, the decay should be removed, retaining pits made for a filling, and the cavity filled with amalgam, shaped to the contour of the tooth. (Fig. 3.)

The root is now ready for the fitting of the band, which should, if possible, be made to the root itself as saving both time and trouble. The collar is generally made of coin gold, or 22 carat gold-plate of about No. 4 thickness.

fine wire, the gold can be cut to pattern and bent into shape with the half-round pliers.

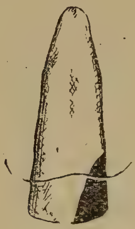

Fig. 3.

When adopting a mandrel in forming a collar, the size or shape is first ascertained by encircling the root with a piece of wire, slightly thicker in diameter than the thickness of the band-gold, the ends being twisted together on the buccal aspect. The wire is then pressed up on the root to the point to which the upper edge of the collar is to go, and burnished to the sides. The wire ring is then carefully removed, laid on a piece of lead, a flat piece of iron placed over it, and with a smart blow of a hammer the wire is driven into the lead. The wire ring is then removed, slipped on a Mandrel that represents the form of the root to be crowned and pressed down gently as far as it will go without stretching the wire. The distance from the end of the mandrel to the wire is measured and noted on a slip of paper and the wire removed. The gold to form the collar is then bent and shaped to the mandrel.

As it is not my intention to enter into all the minute details comprised in the fitting of the band, having already explained this process in a previous paper, I will pass on at once to a further description of the "Mandrel System" relating to the shaping of Tooth-root collars; a description which may be known to some of you, but which is yet of such real interest that I may well read it to you now.

*"This process is the outcome of a general classification of the shapes of the necks of human teeth, which showed that no matter how great differences may exist in the apparent shapes of the crowns of individual teeth of a given class, there is a remarkable uniformity in the configuration of their necks. That is the necks of upper cuspid, for instance, were found

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* Dental Cosmos, Vol. xxviii, No. 8.

to have a fixed type, from which the variations were very slight as to shape, though there appeared to be no exact standard of size. So of all the other classes with the single exception of the superior molars, in which two distinct forms were found, the first being those in which the buccal roots were wider than the palatal; the second those in which the reverse condition was found, the single palatal root being wider at its junction with the crown than the two buccal roots. The occurrence of roots of the second class being rather exceptional, the first class was accepted as the type The configuration of all the necks of the teeth having been determined, a set of Mandrels for shaping collars to fit them. was devised, their shapes being modeled upon the general typal forms of the necks of the teeth which they were to represent.

"The ready-made seamless gold bands of 22 carats fine, No 30 American Guage, are adopted for this system, although there is no reason why the soldered band should not be employed.

"The advantages claimed for the use of the ready-made seamless collars are :—

That they are really labour-saving, as their use avoids the time and trouble of making; that the whole surface of the band is uniformly soft, thus facilitating the burnishing of the gold to the contour of the tooth; lastly, that those seamless collars are so constructed as to telescope, each collar fitting into the series next higher; so that a root may be banded with one size, and the size next larger used to form the tube for the telescoping crown.

"The other appliances specially devised for this system are a "reducing plate," a pair of "collar pliers" and "a small hammer."

"The reducing plate contains holes which are complimentary in shape to the mandrels. The great advantage claimed being that with this appliance collars can be evenly and accurately reduced in size at the edges, without burring or buckling.

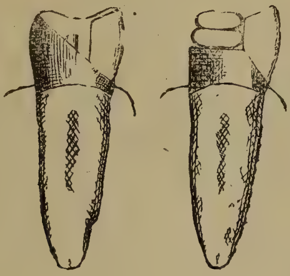
The collar pliers differ from the ordinary contour pliers, only in that they possess an ingenious method of forming guards or stops on the inside of the band, which prevents them from being forced too far under the gum. It is so contrived that the metal is not cut through, but merely raised on the side opposite to the punch."

To better illustrate the uses of these appliances it will be necessary to return to that point of the operation, where the impression of the root has been taken with wire, and the latter being removed, is driven into lead to form an exact outline of the contour of the neck of the tooth.

"The wire ring should now be cut at the lap and straightened out to enable a suitable collar to be selected by comparing the length of the wire with the straight lines in the diagram, which show the inside diameters of the various sizes. Should none of these correspond exactly, take preferably the next size smaller.

"Having selected the collar, fit it to the Mandrel with the special hammer, holding it upon the lead and using a slight pushing force to help in stretching and forming it. The collar should now be removed from the mandrel and tried in the lead impression. If it does not fit exactly, a little more stretching will usually get over the difficulty. In some cases the use of the flat-nosed pliers is advocated.

"If the collar band has been accidentally stretched too much, or if for any reason when brought to shape it is too large, its root end can easily be reduced to the proper size by the use of the contractor. Place the edge of the collar which is to fit the root in the proper hole, hold it level with a piece of an old file, and tapping gently on the file drive the collar into the plate until the proper reduction is made. The collar is next "festooned" to the contour of the gum and the edges chamfered at the expense of the outer surface.



"It should then be tried in position, and having ascertained the exact depth of band necessary below the gum and marked it accordingly, remove it, and form the projections on the inside of the band which are to prevent the collar from being forced further down upon the root than is desirable."

This, gentlemen, finishes the description of the "Mandrel System" relating to the shaping of the collars. It will now be necessary to continue the description of the operation as performed in the ordinary way.

Having marked the line of contour of the margin of the gum upon the front of the band, the proper level can then be cut and the edges squared so that the surface makes an angle with the horizontal portion.

The operator should now take a small piece of thin gold or platinum plate, adapt it to correspond with the shape of the upper surface of the band, and after well boraxing, grasp the edge with a pair of fine tweezers, and adjust the band to it so that it may fit perfectly, and then solder. A very small quantity of solder should be used, and this should be placed outside the band, as otherwise it will tend to flow over the inside of the collar and interfere with the fit of the cap.

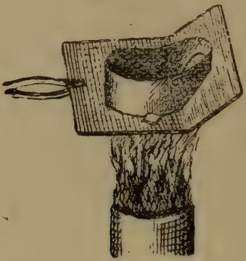


Fig. 5.

The gold should then be trimmed to the collar and the cap adjusted to the root. After this, the surface can be levelled in front to render it invisible when the crown is finished. Whilst the cap is in position, a hole should be drilled through the gold just over the orifice of the canal, with a fissure bur of the same size in diameter as the wire to be used, so that the pin can easily slip into position. It is desirable that the pin shall be made as long as possible to enable the strain, borne by the artificial crown, to be more evenly distributed. These crowns are not limited to the use of one pin, as two or even three can be inserted according to the requirements of the case.

Some prefer, at this stage of the operation to solder the pin to the cap. In this case it is necessary to secure the projecting portion of the pin in position with sticky wax, and having made a final adjustment in the mouth, to make sure of the pin being in the proper position, it can then be invested and soldered.

If, on the other hand, the alternative method be adopted, an impresssion is taken in a small impression cup with either plaster or modelling compound. The cap will generally come away with the impression, but if not it is easily removed and placed in position. The operator should never forget *to obtain an articulation of the jaw.*

When the model is made, the pin is cut off level with the cap and the porcelain tooth fitted. An ordinary flat pin-tooth is ground down to shape and placed in position on the cap so that the labio-cervical edge of the porcelain is flush with the edge of the collar, and level with the contour of the gum. In "Backing" a tooth Mr. Evans suggests the advisability of considering the effect of the various metals used for this purpose, on the colour of the porcelain. He mentions that platinum gives a faint blue shade, and gold or gold lined with platinum, if the gold side is toward the porcelain a slight yellow shade.

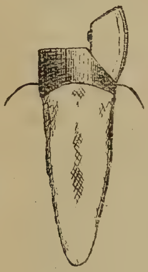


Fig. 6.

Others have suggested that a low carat gold is liable to give a peculiar greenish shade to the part where it comes in contact with the porcelain.

In backing the tooth, see that the gold is bent over the incisive edge and well burnished to the porcelain; this will greatly relieve the strain caused by mastication.

Perhaps it will not be out of place whilst dealing with the subject of backing a tooth, to introduce to your notice an ingenious instrument invented by Mr. J. C. Young. With this instrument the two holes can be punched at the same time, and is also capable of adjustment to suit any sized tooth. No measuring is required, as the tooth acts as its own guage.

On the porcelain front being waxed in position on the cap, a gold top is struck up with a suitable die, representing the biting surface of the bicuspid or molar, as the case may be, this having had the cusps filled in with solder flush with the surface of the metal, is then ground and adjusted to the bite.

Taking into consideration the numerous methods employed in the striking up, or formation of the gold top, I feel that to do full justice to the subject, it will be necessary to describe briefly a few of the more important.

The ordinary zinc die, appears to me to be one of the most useful, inexpensive and suitable dies employed, as it enables the operator to keep a sufficiently large variety of dies at hand. An impression is taken of the crown surface of a tooth, in composition and in pouring with plaster is built up moderately high. On removing the composition, the model should be trimmed in the most suitable form to obtain a good impression in the sand, which should then be poured with zinc. The crown surface of the cast will require burnishing to prevent any possibility of the gold being cut in striking up. This can be easily accomplished with the aid of an agate burnisher.

Another method, very similar to the latter, has been introduced recently, by Dr. Melotte, and as it is the means of the saving of much time and labour, it bids fair to become very popular. The teeth to be copied are first dried. The special tray is then partly filled with Moldine, the surface dusted over with some soapstone powder, and pressed firmly into place. An exact impression of the teeth is the result, but it is necessary to use great care in removing the cup. The surplus of Moldine must then be trimmed off and the rubber ring stretched over the edge of the cup.

Some Fusible Metal is then melted in a spoon and poured into the depression in the Moldine until it reaches half way up the ring. So soon as the metal hardens, the cup and Moldine should be removed from the ring, and the ring still containing the metal plunged into cold water.

The counter die is made by melting some more fusible metal which after being stirred almost to the point of stiffening, is pressed into the ring over the die, and then immediately cooled in water.

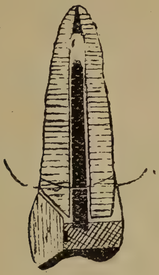


Fig. 7.

On removing the rubber ring the die can be easily separated from its contour by gently tapping. I should note by the way, that Dr. Melotte's Moldine is a preparation consisting of Potter's clay and glycerine.

The next process I would describe is that known as the Hub-Mould and die plate. The hub-mould is used for casting the hubs which are composed of an alloy consisting of one part of tin to four parts of lead

For the purpose of striking up any particular top, the piece of gold is laid over the depression in the die-plate, the hub is then taken between two fingers and held in an upright position, whilst a succession of blows is delivered with a heavy hammer on the hub, this force driving the gold plate into the die and at the same time spreading the hub metal well over the surface of the plate.

Lastly, I would recommend Dr. Melotte's box of crown dies to your favour, because the box is fitted up with a complete set of dies which can be inserted separably into the socket of the holder when wanted. The heads are of bronze, the handles of steel, and a flat piece of lead is all that is necessary whereon to strike up the top.

Whichever method be adopted, the next step will be to consider the quality and the thickness of the metal proposed for use. Some advocate coin gold rolled out to No. 4 tight, others prefer pure gold plate of No. 4 easy. In order to decide as to the respective merits of these, it will be necessary to consider carefully their advantages and disadvantages.

We find that tops made of coin gold will stand a greater amount of friction by reason of the peculiar toughness which the alloy gives to the metal, whereas the pure gold in its greater malleability is more likely to wear away.

The latter, to my mind, is better adapted to this style of artificial crown, on account of the difficulties which present themselves in the process of firing. The pure gold-tops although thinner than those formed of coin gold, allow of the cusps being filled in with 20 carat plate, whereas coin gold necessitates the employment of metal of a lower carat. The advantage of this will be observed in the final soldering, as it enables the investing material to be heated up to a certain degree without risk of the metal flowing away from the interior of the cusps. Another advantage which I claim for the use of pure gold for the tops, is founded on Mr. Evans' remark as to the effect of gold on the colour of porcelain. The advantage is that, as we require to bring the metal well over the incisive portion of the porcelain, the use of pure gold is not only less conspicuous, but does not give that darkish hue to the tip which is so often noticeable in this form of crown.

Before proceeding to invest, a piece of pure gold plate is adjusted on either side of the crown against the wax contour,

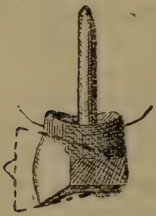


Fig: 8.

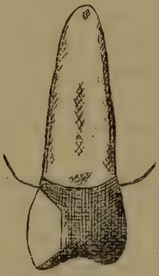


Fig. 9.

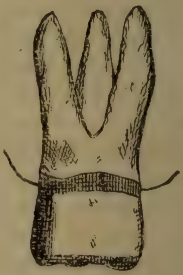


Fig. 10.

and the ends allowed to project forwards that they may be grasped by the investing material. This facilitates the retention of these pieces in position on the removal of a certain amount of the investment from the surfaces of the gold which are to act as the matrices. (Fig. 8.)

The importance of attending to all the minor details relating to the trimming up of the investing material, cannot be overrated, as upon their observance depends the success of the operation. In following this out, it should be our aim to see that all trimmed surfaces are rendered as smooth as possible, thus enabling the heat to be generally distributed over all parts, and all particles to be removed from all corners, in order that the flow of solder into these parts may be uninterrupted.

Mr. Evans advocates the use of calcined marble-dust and plaster, in the proportion of two parts of marble dust to one of plaster, to which he adds a pinch of sulphate of potassium to quicken the setting. He regards this as being the most suitable investing material for this purpose.

Fully appreciating the skill and care which this portion of the operation demands, I venture to detain you a little longer to illustrate a few of the more useful appliances adopted.

In selecting a blow-pipe which may be suitable for use in soldering, it is essential that the flame shall be under the perfect control of the operator, thus enabling the investment to be uniformly and thoroughly heated, and, at the same time, ensuring the maintenance of a regular heat during the process of soldering. I doubt whether any better instrument can be used for this purpose than Owen's hand gas blow-pipe in combination with the foot bellows.

The Knapp blow-pipe deserves some consideration, it being extremely useful for many kinds of work, but as it requires the most delicate manipulation, a considerable amount of practice is needed before one is able to reap the full benefits of the appliance. The flame is formed by combining ordinary coal-gas with nitrous oxide, and its analysis is a mixture of 2 volumes of hydrogen ; 1 volume of oxygen ; and 1 volume carbon.

The remainder of the operation is easily performed, provided the details have been properly adhered to. The solder will yield under the increasing temperature, on the investing material being thoroughly heated. That the solder may be tempted to flow into the cavity, gold filings may be placed with advantage in the orifice. On completing the soldering operation, the crown must be finished off in the ordinary way with corundum wheels, discs, and moose-hide points.

When trying the crown on, previous to cementing, any final adjustment to the bite should be made and the gold thinned as much as possible over the incisive edge of the porcelain front. The artificial crown should then be removed, dried thoroughly, and the pin roughened.

The oxyphosphate of zinc is mostly used for cementing the crown in position. It forms a stronger cement than the oxychloride, is non-shrinkable, decidedly adhesive, and is a non-irritant, whereas the oxychloride is capable of setting up inflammation in the investing membranes owing to its markedly irritating properties.

The root to be crowned, should now be protected by a napkin, or wool-roll, placed on either side of the alveoli, and held firmly whilst the portion of the root is wiped out and thoroughly dried. The application of a pellet of wool saturated in alcohol and applied to the part, is advocated as both aiding in the drying of the surface, and also in acting as a styptic to any laceration of the gum.

The cement which should be mixed to a thin consistency, so that all surplus may exude when the cap is pressed home, is introduced into each root canal. The artificial crown is then well filled and adjusted in position, a sharp tap with a mallet, using a piece of bone as a medium, will assist in forcing the crown well down. The patient should now be directed to bite on the napkin, so as to exert pressure upon the crown whilst the cement is setting. When the material has attained the requisite degree of hardness on the slab, the napkin can be removed from the mouth.

At this point of the operation, an instrument should be passed under the gum in order to remove any surplus cement which may have been exuded, and which, did it remain, would be apt to excite inflammation. Mr. Evans maintains that, if care be exercised in carrying out these little details, recession of the gums, often accompanied by an inflammatory condition, is avoided.

To sum up the advantages claimed for the style of crown which I have just described are, *firstly*, that it is the strongest method of pivoting ; *secondly*, that it is the least liable to permit decay of the root ; and *thirdly*, that the porcelain face is so thoroughly protected on all sides, as to prevent any possibility of its being fractured.

This, gentlemen, finishes the descriptive details of a process, which I trust will receive that consideration, at your hands, which it undoubtedly merits, and in our discussion of it, let us remember that only by a great discrimination to all that is best, in all that is new, shall we arrive at that goal of success to which we are all journeying. Nor in cherishing all that has helped us and has helped others in the work whose history is written, should we lack that cool and critical spirit which enables us to consider as they deserve to be considered, the labours of men who are treading new paths: who are oftentimes sowing that seed from which in a latter day we shall reap a rich harvest. The past is written, but the future is unknown. That it must be a bright future is evident to us all, and I can only trust, in conclusion, that we may both as a body and as individuals, help to garner in the harvest of advance, and to work according to our lights, with those, who day by day are labouring, not alone for the mere vanity of distinction, but for the great and lasting good of humanity.

PRESIDENT'S INAUGURAL ADDRESS.*

By Howard Mummery, M.R.C.S., L.D.S.

Gentlemen,—My first duty in appearing before you tonight is to thank you for the great honour you have done me in electing me to the important post of your President. While well aware of the many deficiencies which render me but little fitted for the position, coming as I do after much more competent predecessors, I will only say that I will make every endeavour to keep up the traditions of the Society, and to render this year as far as it lies in my province to do so, worthy of those which have gone before.

I must confess that this sudden elevation to such an important position comes upon me rather as a shock—it is a strong reminder of the advance of time. A President of your Society can no longer look upon himself as among the junior members of the profession, but must, burdened with the dignity of his office, consider himself in the light of a senior.

It is frequently by a sudden impression that we are brought

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[*] Delivered before the Odontological Society of Great Britain.

to see ourselves in a new light, and I have a distinct recollection of that sudden impression coming upon me when listening to the introductory address at the opening of the medical session, delivered by a friend and fellow-student of mine. I sat again among the students who, as is the way of students (medical perhaps especially) were filling up the time before the lecture by pelting an immovable reporter with paper balls.

When my friend and contemporary appeared in his graduate's gown, and gave much valuable advice to the youthful audience, I suddenly realised that I was his contemporary, not theirs ; so it is that to-night, the dignity you have conferred upon me has given me a still clearer perception of the responsibilities of age.

The Session which commences this evening will, I hope, be marked by profitable discussions and by some well thought out papers from our own members. While fully acknowledging the value of casual communications and descriptions of cases in practice, I think a well considered paper on some subject which the contributor has sought to make thoroughly his own, is of great value ; it not only brings together scattered materials which otherwise might be passed over, but it affords an opportunity for discussion and criticism, which tend to eliminate errors and advance more accurate knowledge.

Papers from others who are not members of our special branch, while they certainly ought not to take the place of members' communications, serve nevertheless a very useful purpose in opening up subjects which have a more or less important bearing upon our work, since there is a danger that in following the very distinctly marked lines of our daily practice we may somewhat narrow our ideas. I think it will be acknowledged that it is highly important for the dental surgeon to keep up as wide an interest as possible in other branches of surgery and medicine, and also in the kindred subjects of physiology and histology. If he undertakes any special line of research he can then do so on a broad basis, his conclusions will be more sound and the benefit from his work more general. Professor Huxley said in one of his addresses, "The man who works away at one corner of Nature shutting his eyes to all the rest, diminishes his chances of seeing what is to be seen in that corner."

There is a tendency with some to separate the so-called "practical" from the "scientific." Surely this rests upon a mistaken understanding of both terms. The practical man avails himself of the discoveries of science; and is not the pursuit of science merely the endeavour after more complete knowledge, without which successful practice is impossible? The practical man who ignores the scientific method, is very apt to fall into empiricism and to draw false conclusions from appearances which are misleading. Science and practice should go hand in hand.

It may seem to us sometimes that the investigation of subjects connected with our own profession is well nigh exhausted; but this can only be from our taking a too superficial view of the case. This was excellently put before us in the opening address of our former President, Mr. Charles Tomes, and it so impressed me at the time, that I venture to quote it here, as important for us all to remember.

"In the pursuit of every branch of knowledge there comes a time when that which lies upon the surface, patent to casual intelligent observation, has been worked out, and when, for further progress a closer and deeper investigation becomes essential. I venture to think that if that closer investigation with the aid of modern methods of research, were applied to our special problems, a sufficiently rich harvest of results would reward the effort."

Let us indulge a little in "the unfashionable sin of enthusiasm," and as our special tastes incline us, take up special subjects of study, and the results will be satisfaction and pleasure to ourselves and the advancement of the profession as a whole.

Above all, let us not as we grow older, cease to learn; let us if possible, avoid that partial paralysis of the intellect that creeps on men with advancing years, a tendency to think that facts learned, and knowledge attained in our youth and prime were final and complete, and an unwillingness to admit the bearing of new observations on our stereotyped knowledge, as if the world had not advanced as we have grown older.

The late Mr. James Hinton, equally well known as a philosopher and a surgeon, says: "Nature is ever misunderstood at first, and most by those who most earnestly study her. Did she not show us as plainly as it was possible to put the thing, the earth going round the sun; and did not we, for ages, think that she meant that the sun went round the earth? we could not help it, and she has had most pathetic patience with us,—she has only said, 'Look again, see this fact, how can it be as you think ?' and when we put that wrong also, she has said again, 'Look here.' Fact after fact she has tenderly laid before us, until at last we could not but see it as she meant it. Hers is the true scheme of education."

In my address to you to-night, I am departing somewhat from the accustomed routine, and hope it will not be looked upon as an innovation if I make this address of a special nature, dwelling upon a subject which has absorbed my attention much of late years, the structure and developmental relations of dentine. I have I think a good precedent for this course in the opening address on an embryological subject, delivered by our esteemed Treasurer on the occasion of his second Presidentship.

My views on the subject of dentine, have, as you are aware been already published in the Philosophical Transactions of the Royal Society for 1891, and in my communication to-night I propose to dwell shortly upon the evidence in support of these views and on the relations of dentine to the other tissues of the body. If I seem to have ventured upon theoretical ground, I must defend myself at the outset from the possible accusation of being wedded to any theory.

Mr Hinton, whom I have quoted before, likens the work of science to the unravelling of a tangled skein of silk. He says: "A tangled skein is tangled or obscure and wrong, only in relation to *us*; it came so by no accident; we must start with the conviction that it can be disentangled—we must be patient, never on any account apply force, to pull it is the worst of all things, we simply examine gently how it is, but if it is anything of a tangle we cannot do this directly—what we have to do is to make a theory of it, to arrive so at a representation, we lay the various threads out one by one in clear and distinct relations, the best way we can see according as the thing *appears*. Then this theory at last reveals the real case, we interpret it. First we look and see what the various threads are (observation), then we arrange them according to our ideas and their appearances (theory), then we see how they really go (interpretation), which reveals to us the fact of the matter and the tangle is unravelled."

Thus we see that a theory—a very dangerous thing wrongly used—is a desirable and necessary adjunct to any investigation taken up on broad lines—the scaffolding on which the edifice is reared.

The theory may only be partially right, but, rightly used, may lead to true results.

Darwin, in one of his letters, says : " Without the making of theories, I am convinced there would be no observation."

My late investigations have been but a humble attempt to unravel a little piece of the tangle (and we must acknowledge that the anatomy and development of the dentine is a very considerable tangle), but I venture to hope that this attempt may lead to an interpretation of the subject more in accordance with the general laws that govern the structure of the tissues of the body, and for that reason, perhaps, likely to be nearer to the truth.

Before proceeding to the special subject of dentine, I should like to remind you of the views of bone structure and development at present held, as an introduction to the special subject before us, and as illustrative of several points which I wish to dwell upon.

The investigations of Professor Sharpey showed clearly that bone is made up of lamellæ, consisting of transparent fibres, " decussating with each other in the form of an exceedingly fine network." These transparent fibres, rendered visible after decalcification of the bone with acids, are, according to the recent researches of Professor v. Ebner, made up of fine fibres corresponding in character with bundles of white connective tissue fibres. Other bundles here and there pass obliquely between the lamellæ. The layers of bone, are also, as demonstrated by Professor Sharpey, bolted together by other bundles of fibres, also corresponding in chemical composition to white fibrous tissue. These last are the penetrating fibres of Sharpey.

We have, then, in bone, the "decussating fibres" forming the groundwork in which calcification takes place, and the penetrating fibres. The " decussating fibres " are, according to v. Ebner, doubly refracting, and are not themselves calcified.

In speaking of the development of bone, I will not touch upon intra-cartilaginous ossification, as it is now well established that, at all events in most cases, this is only provisional. It is replaced later by subperiosteal bone, and by the concentric lamellæ formed around the Haversian canals.

Treating first of intramembranous ossification as exemplified in the bones of the cranium, if we examine the parietal bone when ossification has already commenced, we find a mass of bone in the centre, and spiculæ radiating from it in all directions. These bony radiating spicules are seen under the microscope to be continuous with bundles of fibres, the osteogenic fibres, extending beyond the circumference of the formed bone. These osteogenic fibres are identical in chemical composition with white connective tissue fibres, and are described by Gegenbauer as in some situations directly continuous with connective tissue fibres. They are covered with large granular corpuscles, which also fill up the interstices between them. In the last edition of Quain's anatomy, Professor Schäfer says: "The earthly deposit occasionally appears in an isolated patch here and there on some of the osteogenic fibres in advance of the main area of ossification." Professor v. Ebner considers that the fibres composing these prolongations are not themselves calcified, the uniting substance only being impregnated with the lime salts. We see then that in this form of bone development, bundles of fibres, clothed with cells, project from the surface of the already completely calcified tissue. On the long bones, where the chief addition to their substance takes place, beneath the attached periosteum on the outer surface of the bone, we see an arrangement of tissue elements in many respects similar. Applied to the surface of the bone is a very distinct layer of large granular corpuscles, the osteoblasts. These cells are in direct contact with the bone, and occupy the intervals between bundles of fibres of the periosteum which pass deeply into the osseous substance. The arrangement of the fibres in bundles is here very marked, and also their continuity with the connective tissue fibres forming the periosteal membrane. Here, as in membrane bone, the bony spicules are prolonged by bundles of osteogenic fibres. The fibres which passing from the periosteum enter the bone and pass deeply into its substance, persist as penetrating fibres except where the advance of the concentric lamellæ formed around the Haversian canals has absorbed them and cut them off, for these fibres are not seen in the Haversian systems.

In the peridental membrane we meet with similar appearances—bundles of fibres from the pericementum enter the cement and persist as the penetrating fibres of Sharpey in that tissue—and occupying the intervals between the bundles we find cells, the osteoblasts or cementoblasts.

By some it is considered that the osteoblasts are directly converted into bone, some cells escaping calcification as the lacunal cells, which become surrounded by the consolidated osteoblasts forming the matrix of the bone. According to other authorities, the osteoblasts elaborate the osteogenic substance, not being themselves converted into bone. If it is the case that the protoplasm of the cell is directly converted into bone, we ought, as pointed out by Prof. Schäfer and others, to see the outline of the cell areas in the completed tissues—but this cannot be demonstrated, nor can an osteoblast be seen partly converted into bony structure, but if the conversion view be correct, surely such cells should be met with.

Turning our attention now to dentine, we find that it has been set apart among the tissues of the body as a peculiar substance not formed on the plan of the other tissues, but standing alone in its mode of development.

Two different theories, as in the case of bone, have been held by leading histologists, which may be also described as the conversion and the secretion theories. According to the former --that familiar to us as students of Mr. Tomes' "Dental Anatomy," and held by Prof. Waldeyer and others in Germany —the odontoblast cells are converted into the matrix of the dentine and the sheaths of Neumann, by direct calcification of their substance, processes from these cells remaining uncalcified as the dentinal fibril. According to the contrary view—that of secretion—the odontoblasts secrete a substance, which by calcification, becomes the matrix. This view, with modifications, is held by Prof. Kölliker, Baume, and others.

If the odontoblast cell is converted into dentine by actual alteration of its substance, this must take place in three different degrees; very little, if any, change taking place in the fibril, a peculiar condition being brought about in the part of the cell which forms the sheath of Neumann, rendering it peculiarly resistant to the action of acids, and the rest of the cell becoming converted into the hard substance of the matrix.

As the portion towards the already-formed dentine is used up, the cell maintains its integrity from beneath, so that from the commencement of calcification to its completion, one cell only is engaged in forming the whole depth of the dentinal substance in and around one tubule. It is considered, that a slow diminution of the calibre of the tubule, by a gradual process of calcification of the periphery of the fibril, constantly takes place during the life of the tooth.

In a contribution to a discussion in *Nature* on Weissmann's theory of heredity, Professor Cleland made use of this view of the persistency of the odontoblast cell as an illustration. He says (*Nature*, vol. xli., Feb, 1890, p. 392): "Every anatomist is aware that the living elements of dentine are nucleated corpuscles with elongated branches which are embedded in the matrix, and lengthen as the dentine increases in thickness, while the corpuscles themselves retire inwards, remaining at the boundary of the lessening pulp cavity. The continuity of the tubes containing these fibres furnishes, as soon as one thinks of it, convincing proof that they are the same branches, and the same dentine corpuscles, which are found when the dentine begins to be deposited and when it is completed. But the dentine begins in childhood, and may go on increasing in thickness in old age, with its tubes still continuous, though losing their regularity of position. Therefore, dentine corpuscles continue alive, and without division during the greater part of the life of the organism."

I cannot but think that the odontoblast is a rather hardly used cell; it has not only had to persist during the whole active life of the tooth, but has had to form the soft fibril, the investing tubule, and the matrix of dentine, and in addition to all this, is considered by many, to act as a nerve-ending cell, and conduct sensation to the dentine. This latter function is hardly, I think, consistent with its other offices, and with what we know of the action of cells in other parts of the body. This anomaly struck Mr. Hopewell Smith, in a paper on development, to which I have referred elsewhere, and he would rather consider the function of the odontoblast to be wholly sensory, the cell really being a nerve-end organ, and compared by him to the ganglion cells of the spinal cord, other cells than the odontoblasts being concerned in the formation of dentine. In this case, however, one would expect to find very considerable nerve filaments entering the odontoblasts, and it is also remarkable that in old teeth, the odontoblast layer appears to be absent. Professor Kölliker considers the growth of dentine to be partly by conversion and partly by secretion, and that while the central part of the cell persists as the fibril and tubule, the matrix is a secretion from the odontoblasts and other cells of the pulp. Baume holds that the calcification of the dentine takes place in a material secreted by the odontoblasts.

Concerning the relations of the fibril to the pulp, much further investigation is still called for. Professor Klein describes the dentinal fibril as arising not from the odontoblast at all, but from a separate layer of deeper cells. With the more perfect means now at our disposal for the examination of dentine in its natural relations to the pulp, it is still very difficult to decide as to the origin of the fibril in mature teeth. In many specimens of the teeth of embryos, the processes can be plainly seen to arise from the odontoblasts, as I shall presently show in a photograph upon the screen; but in other specimens from adult teeth, one can trace fibres to a deeper layer than the odontoblasts, and even beyond any layer of cells such as Professor Klein describes.

I think I have sufficiently shown that the subject of the development of dentine is a very considerable tangle, and that very much of it remains to be unravelled, but I will now refer to some recent investigations, and also to my own attempt to disentangle a portion of it. In examining a longitudinal section of a bicuspid tooth cut by Weil's process, and unstained I saw projecting into the pulp cavity all round the margin, processes like spiculæ. The pulp, though partially retained, had been torn away in many places, from its connection with the dentine. These bundles of fibres—for such they distinctly appeared to be—were evidently continuous with the calcified substance of the dentine on one side, and the pulp on the other, The cell layer had fallen away. This specimen seemed so remarkable, that I cut and examined many more, and although this was peculiar in the degree of apparent stiffening of the bundles, I found that fibres from the pulp passing into the dentine and incorporated with it were very constantly met with.

It is very difficult to see these fibres in many instances where the odontoblast layer is strongly marked, as they are hidden by the crowded cells, and it requires a very thin section to show a single layer of cells only. These prolongations also are very transparent, and I found more than once that when I had seen them during the preparation of the specimen, I had lost them when mounted in balsam, their index of refraction approaching so nearly to that of this substance. In older teeth, where the deposition of dentine is not in active progress, and the odontoblasts are absent, the fibres are very marked, and this was especially well shown in a canine from an old person lately exhibited on the screen by Mr. Hopewell Smith, of which I will also, with his permission, show a photograph this evening.

In stained preparations, where the continuous layer of the odontoblasts is not visible, buddles of fibres are distinctly seen, and in many instances these are crowded with small cells, the nuclei of the odontoblasts being visible in the interspaces between the bundles. This appearance puts one very strongly in mind of the osteogenic fibres in membrane bone calcification. If young teeth with incompleted roots are examined, the fine connective tissue fibres are seen passing into the uncalcified portion of the matrix, which is in such teeth proportionally very broad, and the odontoblast cells are seen at the same time forming a very distinct layer, and with separations between them.

Another point shown by these specimens which I shall dwell upon presently, is, that a fine striation is visible in the more recently calcified dentine.

Turning my attention to the dentine of other mammalia, I found in the pulp of the elephant's tusk a very strongly marked connective tissue incorporated with the dentine ; and in the incisor tooth of the rat, this passage of the connective tissue of the pulp into the dentine is more marked than in any teeth I have examined.

Not only, as the photographs will show, can one trace the oblique passage of the fibres into the calcified substance, but in the formed dentine, a strongly marked striation parallel with these fibres, is very distinct.

At the suggestion of Mr. Tomes, I now turned my attention to fish, and choose as a typical vaso-dentine, the teeth of the hake (Merlucius). The strongest confirmation of the conclusion that connective tissue bundles are directly concerned in the process of dentine formation, was given by vaso-dentine.

I here found a distinct layer of connective tissue fibres, or bundles of fibres surrounding the pulp cavity and apparently continuous with the dentine, this layer having been hitherto described as an odontoblast layer by Mr. Tomes.

In connection especially with the subject of vaso-dentine, I must here acknowledge my great indebtedness to my friend, Mr. Charles Tomes, who has not only most kindly given me advice and direction in this research—but has also in the true scientific spirit, when convinced of the correctness of the new light thrown upon a subject he had made especially his own, helped me by every means in his power to render the point still clearer.

When these fibres are distinctly visible as a layer, it is very difficult to detect any cells in connection with the dentine, but in other specimens, where the layer is not so marked, rounded cells are seen forming a distinct layer in contact with the dentine, and these cells can be traced into the bone of attachment at the base of the tooth, where cells precisely similar in appearance are in contact with the bone.

In many of Mr. Tomes' specimens, the substance of the vaso-dentine is seen to be split up into fine fibres similar in appearance to those surrounding the pulp, and running in the same direction, but, curiously enough, at right angles to the very obvious longitudinal striation of vaso-dentine.

Mr. Tomes has, in recent investigations, also found an outer layer of the dentine apparently made up of decussating fibres.

Reviewing these evidences in the light of the remarks I have made above, concerning the development of bone, and allowing, as I think we must, that connective tissue actually enters into the substance of formed dentine, I think some modification of the ordinary views of dentine development is required. While admitting that much of our tangle remains to be unravelled, there is, I imagine, sufficient evidence to lead us to conclude as probable, that dentine, like bone, is formed on a connective tissue foundation.

Other evidence of this is also produced by the pathological decalcification of the dentine that takes place in caries. In a specimen in which caries had penetrated to the pulp (cut by Weil's process, without artificial decalcification), I found distinct connective tissue bundles in the substance of the dentine. Professor v. Ebner has described similar appearances in carious dentine.

The same author also describes a laminar arrangement of the dentine, and expressed himself convinced of this in a paper on "The Fibrillar Structure of the Dentine and its Similarity to that of Bone" published in 1875. In a later publication (the article entitled, "Histologie der Zähne," in the *Handbuch der Zahnheilkunde*, Vienna, 1890), von Ebner says that dentine decalcified in hydrochloric acid in a 10 or 20 per cent. solution of common salt, exhibits a fibrillar structure, the fibres being doubly refractive, and having all the characters of connective tisssue fibres.

Dr. Sternfeld, of Munich, a member of our Society, wrote a paper on the construction of the dentine of the pike, in which he contested the validity of the distinction drawn by Mr. Charles Tomes between vaso-dentine and osteo-dentine.

In this paper he speaks of osteo-dentine as consisting of a fibrillar basis, and compares it to the calcified ligaments of birds, which consist chiefly of bundles of Sharpéy's fibres with a connecting substance.

In another article, in which he criticises Dr. Weil's process of section cutting—speaking of Dr. Weil's description of connective tissue bundles in the substance of the pulp—Professor von Ebner says that as far as his own observations go, natural well-defined fibrous bundles, such as one finds everywhere in loose connective tissue, do not appear in the pulp. He is under the impression that connective tissue fibres running in all directions, exist in the pulp, but no real connective tissue bundles. I think, therefore, that Professor von Ebner cannot have seen the prolongations which I have described as springing from the dentine.

Some very strong evidences of the laminar nature of the dentine are given by several of my specimens. A tooth partially decalcified in strong formic shows lamination very distinctly, and several specimens of carious teeth of my own preparation and from Dr. Miller's collection, show marked signs of lamination. The specimens treated with glycerine by Mr. F. Bennett, and described by him in the *Odontological Transactions*, vol. xxi., show indications of laminæ.

If my observations and those of Professor v. Ebner are corroborated and accepted, dentine will be brought out of its isolated position, and classed with the connective tissues.

The matrix consisting of an intricate network of connective tissue fibres, we can hardly conceive of the odontoblasts as being directly converted into dentine, their fused protoplasm forming its substance, but would rather hold with Baume that "the odontoblasts" (and other cells of the pulp) "secrete a material which calcifies rather than that they are themselves converted into dentine."

In the next room I have, under the microscope, some of the more important specimens illustrating this subject, many of them being those from which the photographs were taken, which will now be shown upon the screen.

I am much indebted to Mr. Theodore Harris for his share in the preparation of these specimens; his help has enabled me to prepare many more than I otherwise could have done, and there is—in such researches especially—safety in numbers.

A series of photographs in illustration of the subject were then shown upon the screen.

British Journal of Dental Science.

LONDON, MARCH 15th, 1892.

WHY WE ARE NOT DISCOVERERS.

Lazy people, and who is not lazy at times, are apt to give as an excuse for not working out original thoughts, ideas, or discoveries the completeness of the knowledge of the present day. Not absolute completeness, of course, but a relative completeness, when to-day is compared with a few years ago. We wish we had lived in the early days of the microscope, when the whole realm of minute anatomy was unbroken ground. We wish we had preceded Tomes *pere*, and could have worked out the anatomy of dentine, or Tomes *fils*, and could have investigated the teeth of fish. We would that the cohesive property of gold, in its applicability to dental uses, had not as yet been noticed; that Bonwill had not worked out the electric mallet, in short, we are far too apt, in our lazy moods, to find it is not we, ourselves, who are at fault, but the conditions and the times under which we live. Most of us are perfectly willing to be, and to take rank as, discoverers, but we want to know what to discover. We fancy that many more of us would show more energy in the direction of original work, were we not weighed down by this feeling of the completeness of things. True it is but a completeness begotten of ignorance, and true, again, that we are fairly tolerant, when some morning we wake up to find our dearest theories upset, and our most assured facts doubted We are not likely to inflict pains and penalties, even though someone sought to reverse our belief in the movement of the earth round the sun, nevertheless, we think it may be doubted whether we have advanced very much further than those who lived a few hundred years back, in seeing the need of realizing our ignorance, rather than being self satisfied with our knowledge. And it is this very self-satisfaction which is the reason most of us fail to make any progress in the science of our art. Take for instance, the account given by Mr. Mummery, of the steps which led to his making those observations which have caused us to regard with doubt the accepted dogmas on the development of dentine, and which, when confirmed, may lead to our having totally new ideas on the subject. True, Mr. Mummery adopted a comparatively new process in approaching the study of the dental tissues, but we may take it for granted, he scarcely expected to light on those appearances which have led him to his conclusions. As he puts it, in the paper read before the Royal Society, "his attention was arrested," and then a careful study of dental literature, showed that to some extent, these appearances had also attracted the attention of others. Here we have the whole history of such discoveries in a nutshell. A period of preparation in acquiring skill by following up old well worn methods ; the adoption, or trial of some new process, an unexpected result, and a period of confirmation occupied in testing and confirming, or perhaps, nullifying the idea or observation. It is only when we test for ourselves the conclusions of others, not accepting them as infallible dogmas, but rather as statements, which are on their trial to be adopted by us, or denied by us, as our own observations teach, it is only then that we can look forward with hope to advancing our science. We have over and over again pointed out the need there is for this self-verification being a part of the curriculum of every student, and though the difficulties in the way of providing the needed accommodation and arrangements are great, we cannot but hope that before long the schools will make some move forward in this direction.

Another of those Jack-of-all-trades, pill-vendors, extractors of teeth and players on musical instruments, has come to an untimely end. This time on a charge of theft. It does not concern us as to the particulars of the evidence brought, but what does strike one as peculiar is that such travelling showmen should be allowed to call themselves "Dentists," and not only so, but should actually be called such by the daily press.

The use of the cheeks as a "pair of bellows" in order to keep up a continuous blast through a blow-pipe, is an accomplishment we all of us should endeavour to acquire during our pupilage, even though the use of mechanical foot blowers has done away with the actual need for the mouth blow-pipe. In blowing glass, however, there seems, so far, to be no mechanical invention which can take the place of the mouth. It is interesting, therefore, to notice that in glass-blowers the distension of the cheeks during such blowing actually leads to some permanent malformation. Dr. Regnault has described this condition in the *Progres Medical*: "When it is commencing there may be slight and unimportant pain. The pain disappears when the dilation is achieved. It varies in degree, and frequently is only perceived when the cheeks are inflated. The limits of the swelling are inferiorly a line joining the chin and the ear, following the inferior oblique line of the lower maxilla; superiorly, another line starting from the ala of the nose, running up to the malar bone to strike the anterior limit of the masseter, which forms the posterior boundary of the swelling. The dilated wall is thus formed of the aponeurosis of the cheek, and of muscles such as the levator alæ nasi, the zygomatics, the orbicularis oris, and especially the buccinator. It is rare for this condition to be so marked as to be noticeable during repose. An interesting accompaniment is the dilatation of Stenson's duct. After the patient has ceased to blow and the cheeks have subsided there remains still some air in the canal, and gaseous crepitation can be perceived on pressing over it. Examination of the mucous membrane also shows the orifice of the canal considerably dilated, and a plug three millimetres in diameter can be inserted into it. Fortunately, the inconveniences to which the condition gives rise are for the most part slight, consisting of occasionally some slight difficulty in keeping the food from getting between the teeth and the cheek, and a tendency to white furring of the inside of the cheek, necessitating the occasional use of an antiseptic mouth-wash."

Celluloid has been tried as a base for artificial dentures and, so far, has been found wanting, but in the thousand and one articles of every-day use it has found a very fitting employment. Now, however, a danger has been pointed out by Professor Boys from its use for such purposes, namely, that Celluloid is inflammable at a comparatively low heat, such as is given by a bright fire at the usual distance at which a fender is placed. Instances are recorded of buttons on a dress and of an imitation amber pipe mouth piece igniting. It is said that by incorporating with the celluloid a quantity of metallic salt, it is made non-inflammable, so that it is at the discretion of the manufacturer to place a safe or an unsafe material before the public. Professor Boys advises the public to discard such articles as smell strongly of camphor, when briskly rubbed, or which emit fumes of camphor when ingited.

The first portion of the "Index to Dental Liturature," appearing as a supplement to the *Vierteljahrsschrift für Zahnheilkunde*, is now complete, and the second, or subject portion, commences in the next issue. The compilers, Dr. Sternfeld and Carl Kellner, ask the assistance of any who may know of scarce matter. It should be sent to the publishers, Messrs. Weiss and Schwaz, Vienna.

In Russia, Dentistry appears to be largely attracting the attention of women. The dental school at St. Petersburg has, during the last ten years, passed 219 students, of these, only 84 were men, the remaining 135 being women. The preponderance of women is also apparent at the Odessa school. As regards the social status of these lady dentists, we are not able to give any positive statement, but a traveller of some experience in Russia, tells us that his lady barber had recently given up that vocation and had gone to study dentistry.

An article in the *Lancet* on the finances of the English College of Surgeons contains some interesting particulars. The total income for the year 1890-91 was £27,174, which is an increase of £8,596 on the income of ten years ago, this increase being partly due the increase in the fees for the membership, and partly to the Erasmus Wilson bequest. The fees for the membership have produced £17,122, for the fellowship £1,830, and for the dental licence £441. In spite of this large income, the *Lancet* points out that the expenditure has more than exceeded it, indeed, the capital has been encroached upon. The examiners received about a third of the receipts, by far the larger portion of this goes to the ten members of the Court of Examiners, who have divided between them £5,500. The balance has been spent on the Museum, the Library, the Laboratories, College expenses and a share in the expenses of the examination Hall. Absolute discretion in the expenditure of this income rests with the council, in the election of which the members have no part. The proportion paid by Dentals is so small that we can hardly claim a voice in the matter but those of us who are members may fairly side with the *Lancet's* view, that those who contribute by far the largest portion of the income should, at least, have some part in the control of the expenditure.

Abstracts of British & Foreign Journals.

PAINS IN AND ABOUT THE JAWS.

By J. E. Garretson, M.D., D.D.S.

The first and most common cause of jaw pain is odontalgia significant of,—

1. Exposure of tooth-pulp.
2. Peridontitis.
3. Sensitive dentine.
4. Confinement of gas or pus in a closed pulp-cavity.
5. The presence of granules of osteo-dentine in a pulp.
6. The recession and absorption of gums and alveolus.

These are familiar every-day experiences, too common to need else than attention being called to them in a preliminary way. To these are to be added the pains of the dentitional period, etc.

Following these I would place syphilis of the tertiary form; undeveloped teeth; first, wisdom-teeth of lower jaw; second, super-numerary teeth; third, anomalous or unique growths.

Next, rachitic conditions in children; the discomfort lying here in a loose relation of the teeth with their sockets. Diagnosis is plain, relating as it does with a prevailing cachectic state.

I would place next pains in the mental region of the jaw that strike a patient suddenly, increase gradually, being soon seconded by a puffy inflammatory enlargement of the whole chin region indicative of a free effusion of the plastic lymph, and which has its termination invariably in the loss of the teeth of the region by reason of exfoliation in the shape of squestra of the alveolar process.

Next is to be placed a dull, heavy, demoralizing kind of pain, situated in the region of a cheek, where cause lies with closure of an artificial opening of an antrum, in which inflammatory change has destroyed the ciliated expression of the mucous lining of the cavity, and where, consequently, the secretion lodges and remains upon the floor of the cavity. In my own practice, where an antrum has remained open some time, and where there has been a general inflammation about the part, I always advise keeping the break open.

Next, erysipelas. This spenific inflammation, when appearing upon the face, expresses itself primarily as of deep origin. A person will complain of pain about the head and jaw, situated principally over the molar bone. The part is sore on pressure. You look into the mouth of a person, but see nothing. You wait a few hours, and now find a developing tension. Here is plainly shown a perversion of the circulation indicative of inflammatory change. A little later the blush expressive of erysipelas is seen. I would like just here to throw out a suggestion to the effect that I have never known a case of local erysipelas that would not yield to a direct application of iron, quinine, and cinchona. A wide thinking man may accept this specific, yet will not be deterred asking as to probable constitutional conditions. The prescription is as follows :

℞ Tinct. ferri chlor......................℥i
Quiniæ sulphatis.....................ʒi
Tinct. cinchona.....................ʒii M

The affected part is to be painted and repainted until the red blush disappears.

The means suggested is not an agreeable application ; it blackens the part. I have found from hospital experience that the ordinary benzoinated oxide of zinc ointment is a salve that may at times happily and efficiently replace it.

Next, malarial pain. Malarial pain finds expression, malarial being the "dis," in a lack of comfort about the teeth that is not easily described. The patient complains of an uneasy sensation in the organs. You find them perfect, perhaps, and are led to an inference of malaria relation through practice of the process of exclusion. Taking, say, twenty possible causes of which malaria is set down as the twentieth, and not finding the trouble related with any one of the nineteen other causes, one alone remains, namely, malaria.

I know of but few instances in which malaria has not yielded to this prescription :

℞ Cinchonæ rubra pulv... ....℥i
Serpentariæ Virg..................℥ss M.

To be put in one and a half pints of water, simmered into one pint, strained when cold, and one pint of Lisbon wine added. The dose is two tablespoonfuls three times a day, best taken just before meals.

Next, neuralgiæ. The causes are various , being local or systemic. The most common seats of these pains are that of the supraorbital region, superficially, and of the line of the superior longitudinal sinus deeply. The pains of these regions are commonly due to eye-strain.

I could mention from my own experience a number of cases where insufficiency of the recti muscles has proven the cause of pain. Take a person, for instance, who focalizes well. He will take up a paper and read it perfectly. The accommodation is all right; but after reading any time, from ten minutes to two hours, the letters begin to blur and pain comes about the head. Almost always the trouble is found here to lie with muscular insufficiency. If such fault be corrected the pain is cured.

Pain located within the lower jaw, or external or internal to it. Inflammatory thickening of the interior dental nerve always presents, as I incline to accept, a certainly observable tumidity of the gum tissues overlying the bone. This being seen of persistent character, the indication is for exposure of the nerve in its canal and its removal; but if the latter stages of secondary or the initial conditions of tertiary syphilis be evident, or if rheumatism be present in other parts of the body, operative procedure will be wisely delayed until fair trial is given of the iodide of potassium.

Just here I have a personal experience to offer that I am sure is of large value. It relates with cases where removal of the inferior maxillary nerve has been practised in the canal, no benefit resulting, but where cure follows neurectomy done at the foramen ovale. Differences as to the result exist here, with the fact that it is the mylo-hyoid branch that is involved. Again, full and complete neurectomy of the inferior maxillary nerve, unattended with cure of neuralgia, has satisfied me that the source of pain lies in the incisive branch of an opposite nerve that is beyond its ordinary line and is prolonged in its neighbour's canal. Pain confined to the mental region of one side finds explanation most frequently in a lesion existing at the mental foramen.

I think this matter about tumidity must certainly be new to some of you, for I have never seen it referred to in a book. A person comes to you with neuralgia in the lower jaw. You perhaps have had a great many cases of neuralgia of the lower jaw, and have done much with them; but I think you will find that always where there is a thickening of the nerve-sheath, or where the lesion lies with the nerve-canal, there is always an external exhibit in tumidity. This is my individual experience. For myself, where I do not see such tumidity, I operate only in the faint hope of relieving a person, but I never do it with confidence; but where I see the tumidity, I treat with assurance. If one comes to you with a condition of neuralgia in the lower jaw, and if you find tumidity and rheumatism as well, you may fairly think of the lesion as lying with the rheumatic condition and endeavour to verify your diagnosis by anti-rheumatic treatment.

Neuralgia along the line of the temporal artery is always associated with the auriculo-temporal nerve. Its cause, if my experience be not unique, lies with exhaustion. It is a pain rare in men, but common to weak over-worked store girls. Indication is for rest and change. The sea-shore is the best place to send the patients. As a tonic, my individual experience favours the use of a formula as follows:

R Hydrarg. bichlor., gr. i.
Liq. arsenici chlor., ʒss.
Tinct. ferri chlor., ʒii.
Acid. hydrochlor. dilut., ʒi.
Syr. sarsaparillæ, ℥vii. M.
Dose.—Tablespoonful one-half hour after meals.

Section of the nerve, and removal of an inch, has never failed in my own hands to result in local relief.

Next, pain of neuralgic character located persistently about the region of the infraorbital foramen, like that of the mental locality, is not unlikely to have as its cause a periosteal thickening of its membrane as it associates with the opening.

Section of the nerve in these cases is to be practiced by removing the anterior wall of the antrum and making the division well back of the lesion. If the nerve be cut in front of the foramen, the result is transference of the expression of irritation to some other locality.

Next, pain about the bridge of the nose. This I am to infer out of my individual experience to associate with a lesion somewhere about the ophthalmic division of the trifacial. I think this pain is persistently defying. It is difficult as a performance, to cut this first branch, which, as remembered, comes from the brain-case through the sphenoidal fissure, being in close relation with the optic nerve. I am satisfied that in every instance this neuralgia is expressive of a local lesion.

Next is the form of neuralgic pain that is unlocatable, being to-day in this bone or part, and to-morrow somewhere else. For myself, I am at a great loss here, save a lesion discovered itself plainly and openly. Cause may be constitutional or it may be local. And only thing to be done is to look, first, locally ; second, systematically.

Western Dental Journal.

A SOMEWHAT UNUSUAL RESTORATION OF A FRACTURED INCISOR TOOTH.

By Oswald Fergus, D.D.S., Glasgow.

On the morning of the 29th January I was consulted by Master G. W. S., æt. 11, who gave every indication of acute suffering, as well as of considerable nervous excitement. On his arrival at school, at an earlier hour, he had violently collided with one of his companions, the result being that the left upper central incisor was snapped, about one-third of the crown remaining *in situ*, while two-thirds were knocked off. Such a loss at any time must be considered as serious, and doubly so in a mouth where development is still in progress, and if aggravation were required it was furnished in the incisors being unusually prominent, a feature well developed in more than one member of his family. My first inquiries were as to what had become of the detached incisive portion, which fortunately the patient had had the presence of mind to recover and bring with him, and a brief examination sufficed to show that the line of fracture was a clean one. Attention was next turned to the mouth, and on carefully removing a small quantity of blood it was found that the broken surface there corresponded to the part now in my possession. The pulp was, as might be expected, fully exposed and slightly protruding from the opened cavity, while there was slight pain upon gentle pressure, due doubtless to the shock that the tooth had received in its socket from so violent contact. The only misgiving that presented itself was as to the condition of the root, more especially as to its complete formation towards the apex, but observing that the other members of the series were well advanced in their formation, it was concluded that there would not be much trouble in this direction, a surmise that happily proved an accurate one. The patient was now thoroughly anæsthetised by means of nitrous oxide, the pulp carefully reamed out with a Gates-Glidden drill, and the chamber cleared more thoroughly with an ordinary barbed nerve broach, the whole being douched with bichloride solution (1 in 1,000). A temporary dressing of chloride of zinc was then introduced into the vacant pulp cavity for the purpose of mummifying the dentinal fibrils, and the patient dismissed till the afternoon.

In his absence the detached portion, which had been kept moistened in carbolic solution, had a groove or gutter cut in the dentine to as great a depth as was considered safe, and into this was fitted a gold T-piece, the stalk being formed of the ordinary crown wire; and the head soldered to it.

At 4 P.M. the patient returned, and on removing the dressing it was noticed that practically no oozing had taken place, while sensibility on pressure had disappeared. The apex of the root was then closed with a small piece of gutta-percha moistened in chloro-percha, dusted with iodoform, and the pulp canal enlarged in the usual way with a set of graduated drills, till wide enough to take in the stalk of the T-piece. The parts of the tooth being now approximated in their normal situations, the adjusted was found to be as perfect as had been anticipated; a little of "Richardson's crown setting" was therefore mixed to the consistency of fine cream, the T-piece first cemented into the broken fragment, and that again with its now attached gold stalk finally adjusted to its old place.

Glasgow Medical Journal.

CROWN TOOTH-POWDER.

Powdered cuttle-fish bone	15 drs.	Powdered sugar ...	15 drs.
Powdered borax ...	5 ,,	,, orris-root ...	10 ,,
,, Castile soap	5 ,,	Precipitated chalk ...	50 ,,
		Oil of wintergreen, a sufficiency	

Rub up the oil of wintergreen with the precipitated carbonate of lime; when thoroughly mixed, add the other ingredients. Mix well and sift.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, February 1st, 1892. Mr. J. Howard Mummery, M.R.C.S., L.D.S., President, in the Chair.

The Minutes of the last meeting were read and confirmed.

Mr. C. W. Croft Handley having signed the Obligation Book, was formally admitted a Resident Member by the President.

Mr. Josiah Mansbridge, L.R.C.P., M.R.C.S., L.D.S. Eng., of 112, Harley Street, W., was nominated for Resident Membership.

The President then stated that the Council had nominated for Honorary Membership Mr. Christopher Heath, F.R.C.S., and it was in order for him to ask the Society to confirm the Council's nomination, and proceed at once to the election of Mr. Heath.

Upon this being put, Mr. Heath, F.R.C.S., of 36, Cavendish Square, was unanimously elected as Honorary Member.

The following gentlemen were balloted for and elected Resident Members:—J. E. Harris, D.D.S., Mich., D.D.S. and M.D. Univ. of Maryland, U.S.A., 32, Queen Anne Street, W.; J. Percy Smith, L.R.C.P., M.R.C.S., L.D.S. Eng., 26, Eaton Terrace, Eaton Square, S.W.; E. W. Roughton, M.D., Lond., B.S. Lond., F.R.C.S. Eng., 33, Westbourne Terrace, W.; Percy Edgelow, L.R.C.P. Ed., M.R.C.S. Eng., 7, Old Burlington Street, W.; Michael Y. Woolf, L.D.S. Eng., 1, Marlborough Place, St. John's Wood, N.W.; W. H. Wheatley, L.D.S. Eng. and Glas., 14, St. James' Road, Victoria Park; and the following gentlemen were elected Non-resident Members:—J. S. Amoore, L.D.S. Eng., 7, Abercrombie Place, Edinburgh; W. Palethorpe, L.D.S. Eng., 83, Edmund Street, Birmingham; E. T. Cooksey, L.D.S. Eng., 26, Marine Road, Worthing.

The Curator (Mr. Storer Bennett) stated that he had received an extremely interesting donation to the Museum from Mr. Oswald Fergus (Glasgow). The specimen was a left upper lateral root, on which a tube tooth had been crowned—pivoted, as it was formerly called—in 1840, fifty-two years ago. The crown was seen to be quite firmly attached to the root, and it was interesting to notice that a narrow margin of enamel was left on the palatine side of the root, in a manner that would now-a-days be considered very unsafe. The root, which gradually loosened and was finally dislodged in eating, was encased at its upper half in a thick layer of hard, brown, nodular tartar The corresponding tooth on the opposite side of the mouth contained a gold filling on its palatine surface at the margin of the gum, and this was inserted by the same operator—a dentist in Glasgow—fifty-nine or sixty years ago. The condition of the other teeth was wonderfully good for one so advanced in years as was this patient.

Mr. Tomes showed some sections cut from a tooth picked up in a churchyard, which had presumably been buried for a number of years, and had ultimately found its way up to the surface. The chief interest attaching to it was that the dentine was to a very large extent tunnelled by borings of uniform diameter, which could hardly be due to anything other than a fungus. Mr. Mummery had suggested that its manner of growth recalled that of some of the moulds. In many places the borings followed two directions, more or less at right angles to one another, the one being along the dentinal tubes, which are greatly but uniformly enlarged by it, and the other along planes corresponding to those incremental layers along which disintegrating dentine so often breaks up. Where the dentinal tube was traversed, the enlarged portion passed abruptly into that which was unchanged, so that the idea of a mere chemical solvent creeping down the tube was negatived. And although its usual course was along lines which might be regarded as those of least resistance, it was perfectly capable of drilling the dentine in any direction whatever, quite irrespective of the tubes or the lines of growth. This fact has a bearing upon the phenomena of caries. We are in the habit of supposing that the micro-organisms of caries do not do any direct work in softening and tunnelling the dentine, but that they cause fermentation changes in mucus, food, or what not, and that the decalcifying acid is derived from these sources. Such may still be the right view, and indeed the borings exhibited do not bear any close resemblance to the phenomena of caries, but nevertheless these sections prove that a fungus can, unaided, or aided only by the decomposition of the organic material present in dentine, drill it freely in any direction.

Photographs of the sections taken by Mr. Mummery were thrown upon the screen, and the illustrations are printed from photographs taken by Mr. Mummery and Mr. Tomes.

Mr. Storer Bennett asked where the tooth was picked up, and at what date.

Mr. Hern inquired whether there was any evidence of the presence of caries in the tooth, and if so, whether any connection appeared between it and the tunnelling to which Mr. Tomes had referred.

Mr. Tomes replied that the tooth had been found in the graveyard of a very old church in Warwickshire. There was Norman work in the church, so it was possible that the tooth was of great age. There was no caries, or at least there could be no question of the fungus having spread from it, for it (the fungus) was not found most abundantly where caries would occur, but in the roots of the tooth. The main interest of the specimen was, of course, that the tunnelling or borings had occurred out of the mouth, and so out of the possible area of action of acids which were usually supposed to effect such decalcification.

The President then delivered his Inaugural Address, which was illustrated by lantern slides and specimens placed under microscopes. (See page 255.)

Mr. C. S. Tomes said that Mr. Mummery had been so good as to show him his specimens in various stages of preparation, but he felt that Mr. Mummery's acknowledgements of help from him (Mr. Tomes) were really in excess of what he deserved. He had very carefully examined both Mr. Mummery's sections and some old ones of his own, and he was entirely and thoroughly convinced of the truth of the results at which Mr. Mummery had arrived. Mr. Mummery's research had to a great extent upset a comparison which Mr. Tomes had instituted between osteo-dentine and vaso-dentine. He had described a layer which he now recognized as connective tissue fibres in pulps forming vaso-dentine as odontoblasts, but Mr. Mummery had shown these to be much larger and to be devoid of nuclei, and had further found among them some cell structures much more nearly resembling odontoblasts or osteoblasts. In his own old specimens, Mr. Tomes could see that vase-dentine was wholly built up of these fibres, which were continuous with connective tissue framework of the pulp Mr. Mummery's paper opened up a large field of research; the odontoblasts and their processes, the dentinal fibrils, were left out in the cold, and nothing was really known about them less, probably, than was known about osteoblasts and other similar cell structures. And again, the whole question of the sensibility of dentine was left unanswered, although he believed that Mr. Mummery was still engaged in working upon the subject. Mr Tomes felt the Society would agree with him that Mr. Mummery had opened out a very wide field for future work, and had dwelt far toc slightly upon the very great labour which the research had cost him.

Mr. Sidney Spokes said he did not know whether he was in order in remarking upon a Presidential address, but as a younger member of the Society perhaps he might be permitted to follow the example of an authority like Mr. Tomes. He wished to add his humble need of praise for Mr. Mummery's work. He had been stimulated to try and follow to some extent in his footsteps, and had now several sections prepared by the Weil process, which showed many of the points to which the President had drawn attention. Perhaps it was scarcely fair, after the President had told them so much, to try and get further information, but those who were interested in these matters would be glad to know if Mr. Mummery had found any sign of lymphoid tissue, any indication of peri-vascular lymphatic spaces in the pulp. Also whether, considering recent observations showed that there was no absolute continuity between sensory nerve fibres and the central cell, the President did not think there might be a somewhat analogous condition at the periphery in the pulp, rendering it unnecessary to believe that the ultimate nerve fibril was in actual continuity with the dentinal fibril, but only brought into relationship with it. He apologised for obtruding these remarks, but was quite sure they all felt indebted for the excellent work Mr. Mummery had done.

Mr. Mummery, in reply to Mr. Spokes, said he had not found any trace of lpmphatic tissue in the pulp, but he had not stained or examined the tooth pulp for that purpose. With regard to the possible connection between nerve fibres and dentinal fibrils he must be permitted to reserve his reply, as the investigations on which he was at present engaged dealt with that subject, but they were not yet sufficiently advanced to allow him to give any results. Mr. Tomes had referred to some of his (Mr. Mummery's) conclusions being subversive of former researches of his own, but these only affected a small portion of all the important work Mr. Tomes had done, which would still remain unassailed and conclusive. Finally, he would heartily thank Mr. Tomes for the friendly way in which he had reviewed his work, and the Members of the Society for the kind manner in which his address had been received.

STUDENTS' SOCIETY, LIVERPOOL DENTAL HOSPITAL.

The last General Meeting in connection with the above Society was held February 19, 1892. R. H. Bates, Esq., in the chair.

The Secretary read the minutes of the previous meeting which were duly confirmed.

Casual Communications were then brought forward in which Messrs. Bates, Philips and Byrne took part. Mr. Bates exhibited a good collection of teeth, which, owing to some abnormality at their roots were impossible to be treated as dead teeth, with any good result. Mr. Woods exhibited a good specimen of a supernumerary tooth, taken from an adult person. Mr. Byrne showed a very similar case as the one just mentioned. Mr. Phillips explained the reason why he did not hold his annual prize examination on Dental Surgery, and stated that he was still anxious the students should benefit by it, and had, therefore, resolved to present the value of the prize he had in previous years given, to the Students' Society (applause).

The chairman then called upon Mr. Osborn to read his paper on "Treatment of Pulpless Teeth."

A lively discussion ensued, taken part by Messrs. Bates, Mansell, Phillips, Byrne and Wood.

Mr. Guyler then proposed a vote of thanks to Mr. Philips for his generous donation, which was seconded by Mr. Woods and carried unanimously, and after a vote of thanks had been accorded Mr. Osborn for his interesting paper, the chairman announced the next meeting for March 8th, 1892.

Dental News.

DENTAL HOSPITAL OF LONDON.

At the Annual General Meeting of governors of the Dental Hospital of London, held March 10th, 1892. The Committee of Management presented their Thirty-fourth Annual Report.

This states that the prosperity of the Institution continues, and that its usefulness in relieving pain and suffering amongst the poorer classes is each year more thoroughly appreciated and taken advantage of by the indigent.

The total amount received for the General Fund during the year was £3,658 14s. 8d., against £2,661 13s. 2d. in 1890. The donations of Life Governors during the past year for the General Fund, amounted to £816 11s., as against £678 10s. in 1890, while the General Donations amounted to £147 8s. 3d., as against £255 19s. 8d. in 1890. The Annual Subscriptions amounted to £972 1s. 6d., as against £975 6s., in 1890.

The amount received from the Metropolitan Hospital Sunday Fund was £113 5s., and from the Hospital Saturday Fund £55 9s., being a slight increase on the amount received from the same sources in 1890. The sum of £36 15s. was received towards the Mortgage Redemption during the year (Extension Account). The Committee gratefully acknowledge £900, being the legacy of £1,000 less duty, bequeathed to the Hospital by the late William Bradfield, Esq., and they feel much indebted to the executors of the Will, viz. :—Mrs. Bradfield, Isaac Smith, Esq., and John Hayes, Esq. (who have respectively been elected Honorary Life Governors of the Hospital), for promptly paying the amount, which was utilised for part re-payment of the mortgage debt of the Hospital.

The Committee regret that there is still £1,000 owing of the Mortgage debt, which they sincerely appeal to those friends of the Charity who have not already done so, to kindly assist them to reduce.

The total number of operations performed last year was 54,177, being an increase of 5,413 over 1890.

In consequence of the still increasing number of Patients it has been decided that, in addition to the Morning, all Departments of the Hospital shall be open in the Afternoon, Sunday Afternoon excepted.

A Sub-Committee has been appointed to consider the advisability of addition to, or alteration of, the Hospital, with a view to securing further accommodation.

The Managing Committee are pleased to be able to announce that the "Dental Appliance Department," in connection with supplying Artificial Teeth, &c., is still doing good work on behalf of the Charity.

On the recommendation of the Medical Committee, it was resolved to appoint a "Mechanical Superintendent," to have charge of the Dental Appliance Department during the whole day; also a Laboratory Assistant; both to be paid out of the funds of the Appliance Department.

The hot water apparatus has been remedied at a cost of £76, and £157 3s. 6d. has also been expended in cleaning part of the interior of the Hospital, and for painting and colouring the outside.

The wiring, &c., of the Hospital for electric lighting has been carried out at a cost of £254, £100 of which, as promised, has been contributed by Henry Whiting, Esq., and the Medical Staff speak very highly of the convenience afforded by its introduction.

The Honorary Auditors having resigned their appointments, Messrs. Woodburn Kirby & Co., Chartered Accountants, have been appointed professional Auditors.

The Managing Committee regret to report the loss, by death of the following Vice-Presidents of the Hospital:—The Earl of Dartmouth, The Right Hon. W. H. Smith, Henry A. Brassey, Esq., Samuel Cartwright, Esq., Thomas Hyde Hills, Esq., and Dr. C. J. B. Williams.

The death of Mr. Samuel Cartwright caused a vacancy for a Consulting Dental Surgeon, and Mr. Thomas Arnold Rogers has kindly accepted the post.

The Committee regret to have also to announce the decease of Sir James Risdon Bennett, M.D., Consulting Physician to the Hospital.

The Committee have the gratification to announce that Sir Richard Quain, Bart, M.D., has accepted the post of Consulting Physician to the Hospital.

At a Meeting of the Managing Committee, on the 16th November, the resignation of Mr. Septimus W. Sibley. as Chairman of the Committee of Management, through ill-health, having been received, a vote of sympathy was passed, and in order still further to emphasize the recognition of Mr. Sibley's valuable services, his name has been added to the list of Vice-Presidents of the Institution.

The Managing Committee congratulate the Governors upon having obtained the consent of Charles J. Hare, Esq., M.D., to act as Chairman.

In accordance with the Bye-laws, the following gentlemen retire by rotation from the Committee of Management:—The Honourable A. Lyttelton, Lieut.-Colonel G. Lambert, The Rev. Oakley Coles, Messrs. G. Gregson, T. H. G. Harding, Victor Horsley, F.R.S., J. H. Mummery, Noel Whiting, jun., A. Willett, and A. J. Woodhouse.

The Committee beg to recommend the re-election of Lieut.-Col. G. Lambert, The Rev. Oakley Coles, and Mesers. Gregson, Harding, Mummery, Whitting, Willet, and Woodhouse.

Votes of thanks to the Medical Officers and the Secretary were also passed.

The report of the Medical Committee was also presented. It drew attention to the fact that the school has found that notwithstanding the enlargement of four years ago, there is still considerable crowding, both as regards students and patients, which it was hoped might be materially relieved by opening the Hospital for the reception of patients for stopping, by appointment, in the afternoon; this plan not having afforded the relief desired, the Management have at the earnest request of the Medical Committee, decided to open the Hospital in all departments in the afternoon.

The number of demonstrators has been increased from two to four.

The Committee announces with extreme regret the resignations of Mr. Claude Rogers, Mr. Lawrence Read, and Mr. George Parkinson. Their places have been filled by the election of Mr. W. Hern, Saunders's Scholar for his year. Mr. Baldwin, Saunders' Scholar in 1883, and recently Medical Tutor.

Mr. Bird and Mr. Mills, who have for many years so ably acted as Anæsthetists, have also found it necessary to sever their official connection with the Hospital. Drs. Dudley Buxton and Frederic Hewitt, have been promoted to be Anæsthetists, and Messrs. C. Carter Braine and Henry Davis, have been elected Assistant Anæsthetists, Mr. Rowell more recently having been appointed for Anæsthetic duty in the afternoon.

The Annual Prize Distribution was held in July, at the Royal Institute of Painters, at Prince's Hall, when Archdeacon Farrar occupied the chair; the address delivered to the students was full of interest, and the evening was considered an exceptionally pleasant one.

The detailed report of the operations performed in 1890, 1891 and 1874, the year in which the Hospital was removed to Leicester Square, are entered below, in order that the large increase of work may be seen :—

		1874.	1890.	1891.
Extractions	Children under 14	4,510	4,910	5,028
	Adults	5,334	12,636	13,075
	Under Nitrous Oxide	2,392	9,680	11,214
Gold Stoppings		1,292	3,502	5,158
White Foil ditto Plastic ditto ..	.. ..	2,264	12,662	13,398
Irregularities of the teeth treated mechanically		487	700	962
Artificial Crowns and Pivots ..		—	216	274
Miscellaneous Cases		2,976	4,458	5,068
TOTAL		19,255	48,764	54,177

On comparing the two last years, it will be found there has been a considerable increase in every department, pointing to the fact that the benefits to be received at this institution are greatly appreciated by the poor, who, it may be hoped, are learning to value the teeth, and perhaps even to recognize their importance as one of the chief factors in keeping the body in health.

Such increase of work, however, can only be maintained if the finances of the Hospital are materially helped by the charitable public, not only because of the increase of expenditure necessitated in the treatment of increased numbers, but also because additional accommodation will be required in order that it may be possible for the work to be done.

The Appliance Department has proved eminently succesful both in its educational and charitable aspects, a large number of patients having been supplied with artificial dentures, obturators for cleft palate and oral splints of various descriptions; the students meanwhile have had opportunities, under the supervision of the staff and demonstrators, not only of taking impressions, but of constructing and adjusting the various appliances.

The Electric Lighting of the Hospital has been of incalculable advantage both to the students and patients, and has enabled the operations to be continued in spite of fog in the morning and darkness in the afternoon.

The Committee before bringing their report to a close, would again call attention to the very valuable services rendered to the Institution by the Anæsthetists, and to place on record both its high appreciation of their labours, and also its best thanks to them for the time and trouble they have so freely given in the service of the Institution.

The following gentlemen have filled the office of House Surgeon during the year :—Messrs. G. Hern, W. S. Holford, W. May, W. H. Wheatley. Messrs. C. J. Allin, H. A. Forsyth, E. Gardner, and P. L. Webster are at present holding the appointments.

H. I. M. the King of Hungary has appointed Dr Josef Arkövy, Docent and Director of the University Dental Clinic in Budapest, as Professor of Dentistry in the Royal University at Budapest. For over 10 years Dr. Arkövy conducted a private clinic which attracted quite a large proportion of senior medical students, several of whom adopted dentistry as a speciality. It was here he conducted those researches which have made his name known throughout the whole dental world and enabled him to write his *magnum opus* "*Diagnostik der Zahn Krankheiten.*" About three years ago the clinic was more officially recognized by its being transferred to rooms in the principal hospital.

The appointment of Arkövy to a Professorship is a well deserved recognition of his ability as writer, teacher, clinician, and practitioner.

This honour will afford lively satisfaction to the new professor's many English speaking friends and admirers who would no doubt be more numerous still were he to publish the long promised English edition of his treatise on Dental Pathology.

Another item of dental news from Budapest is the founding of the first dental journal published in Hungarian, with the title of the "*Odontoskop.*" Dr. Josef Iszlai is the editor, which in itself ought to ensure good scientific contributions to the latest addition to dental journalism.

DENTINE.

White Castile soap ...	1½ oz.	Oil of wintergreen ...	30 minims
Glycerine	4 ,,	,, cloves	10 ,,
Eau de Cologne ...	6 ,,	Essence of vanilla ...	½ oz.
Hot Water	6 ,,	Carmine colouring, a sufficiency	
Oil of peppermint ...	20 minims		

Dissolve the soap in the hot water, add the glycerine and vanilla. Dissolve the oils in the S.V.R. Mix the two solutions, add the colour, allow to stand twenty-four hours, and filter. A little powdered charcoal in the filter improves the preparation.

VACANCIES

The Victoria Dental Hospital, Manchester. There is a vacancy for an Assistant Dental Surgeon. Applications to be made to the Honorary Secretary, on or before April 15th.

National Dental Hospital, 149, Great Portland Street, W. The post of House Surgeon is vacant. Applications to the Secretary, by March 25th.

ERRATA.

Page 203, lines 19 and 20, should read: "their obvious duty, have been men who at any rate are not behind the absentees truly as the number of diameters" instead of "their obvious duty, have been men who at any rate are behind the absentees not truly as the number of diameters."

British Journal of Dental Science.

No. 581. LONDON, APIRL 1, 1892. Vol. XXXV.

TREATMENT OF PULPLESS TEETH.*

By Mr. Osborn.

Mr. President and Gentlemen,—The subject of my paper to-night, is one about which very little new can be said, still a review of the main features can help to freshen our knowledge of this much debated branch of our profession. By the term, " treatment of pulpless teeth," I mean the treatment of teeth, the pulp of which is too far diseased to preserve, either from simple exposure, or other pathological condition.

To begin with, let us enumerate some of the most common ways under which the pulp is attacked.

We have Irritation, Congestion, and Inflammation, Suppuration, Fungus, Fatty degeneration, Calcification, Atrophy, Putrescence, and lastly Mummification, or Gangrene.

The last two are conditions resulting from disease.

Now to enumerate the symptoms and treatment of some of the most common of the above, the treatment I may as well say at once, is of course extirpation, for as I have said before, I presume in this paper, it is out of the question to attempt the saving of the pulp.

In simple irritation, the sensibility becomes very much exalted, in fact, a state of Hyperæsthesia, the pulp being easily excited, but the pain so produced, soon subsides.

Congestion arises from an undue fullness of the blood-vessels, combined with the retarded return flow of blood. Sensibility is not much more than that produced by simple irritation, differing mostly in being dull and heavy, if the congested organ is wounded, blood flows freely.

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* A paper read before the Student's Society of the Liverpool Dental Hospital.

In inflammation, the amount is still greatly increased with complete stasis at some points, and also accompanied by effusion and exudation into the walls of the vessels. Pain becomes sharp and throbbing, often in paroxysms, thermal changes affect greatly. These affections are most common in general practice, the causes are, exposure to the food and acids passing through the mouth, also by nodules of secondary dentine forming in the chamber, accidents, blows, &c.

We are all familiar with the putrescent pulp, our nasal organs alone often lead us to a correct diagnosis, the pulp has lost its vitality and becoming decomposed, pus forms, and if it cannot escape, causes an alveolar abscess to form, much pain and swelling of the parts around, the tooth becomes loosened in its socket, seems longer than the adjacent teeth, discolouration is often evident, caused by pigment entering the dentinal tubules.

About the remaining diseases, little need be said, except, mummified or gangrenous affections. In this affection, the soft tissues become gangrenous, and awaken a new train of symptoms, due mostly to the dangerous character of the changes which accompany this condition. It is of most frequent occurrence in children, after the acute form ot Inflammation of the pulp following caries, particularly of the deciduous teeth. It is also connected with diseased conditions of the periosteum, or other peridental structure. Sometimes, no causes can be found for its appearance, although it would seem difficult to make out how it could occur as a simple idiopathic affection.

It causes, of course, destruction of the pulp, either mummification by abstraction of all the moisture from the tissues, the pulp being left in a shrivelled dried up state ; or, as is more frequently the case, the whole mass breaks down rapidly into a uniform cheesy, greasy, smeary substance, containing the elements of the tooth pulp, associated with fatty degeneration.

Now as to the best methods of extirpating the pulp, many say that all pain should first of all be checked by the application of some soothing medicament, such as equal parts of creosote, and oil of cloves, that is purely a matter of opinion, personally, I do not think it is needful.

Which is the best way to devitalize the pulp? Some say, give an anæsthetic, and extract at once with a needle, granted gas being used as the agent, is there time to properly remove the pulp? I think not in most cases. Others may use nitric acid, that can at once be dismissed as too painful. Cocaine is used by some with varying success, and many other ways are resorted to. In my humble opinion, there is nothing better, less painful, and surer than arsenic. Should it be used pure, or mixed with other medicaments? I think it best to use pure white crystal arsenic, it does its work well and satisfactorily; if you want to use it adulterated, a very good formula is :—

Arsenious acid, Tannic acid, and Sulphate, or Acetate of Morphia in equal parts.

Be sure to fully expose the pulp before applying. It should be applied on a very small piece of cotton wool, soaked in carbolic, $\frac{1}{30}$ to $\frac{1}{50}$ of a grain is ample, great care should be taken to ~~send~~ Seal up the cavity well, as serious results may follow, if the arsenic is allowed to escape, sloughing of the soft parts, and exfoliation of the bone resulting from carelessness in this way.

The application should be allowed to remain in, from 24 to 48 hours, although longer will do no harm, provided the cavity is properly sealed. When ready, the chamber should be well opened up with a rose-head bur, a clean new nerve extractor, Donaldson for preference, inserted up the canal, along the side of the pulp, up to the apex, give one or two turns, and gently withdraw the needle, the pulp will be found to come away entire.

Wipe out the cavity with cotton wool, or bibulous paper wrapped round a smooth broach, the wool being] steeped in pure carbolic acid, or carbolic combined with glycerine, campho-phenique is also good. Here again opinions differ, lately so many of the older preparations have been found to be entirely without any antiseptic properties.—Iodoform, for instance,—but the above are about the best. Then thoroughly dry the canal with hot air, or a very good way, is to have a silver, or platinum wire, on which is a copper bulb; this bulb should be heated, and the heat is conveyed through the bulb to the wire, keeping it hot, the wire being inserted up the canal and allowed to remain some time; this thoroughly clears the cavity, a great point in the true treatment.

Many differ as to the true effect of arsenic upon the pulp causing its death. Some high authorities say the course of action occurs in this order:—Irritation, congestion, inflammation, death ; is it so or not ? for others say, no not at all, it is simply caused by the peculiar destruction, and escharotic effect of the arsenic causing disorganization and death.

There is a great difference of opinion as to whether the canals should be enlarged by a drill or not. For my own part I think it is best to leave them in their natural condition, but with proper treatment, sometimes the canal is so fine, as in bicuspids, that it is impossible to thoroughly cleanse, then by all means enlarge the canal, or again it is stopped often by nodules of secondary dentine, in these cases nothing is left but to use the drill.

Now comes the treatment of teeth, the pulps of which are already dead and most likely in a state of putrescence, often accompanied by an alveolar abscess. In these cases the tooth should be opened up, and thoroughly cleansed, then apply some antiseptic dressing,--Iodoform and vaseline, carbolic and glycerine. Dr. Miller, of Berlin, has most distinctly shown that iodoform is not of the least use as an antiseptic, he has demonstrated this by rolling a pulp in iodoform, and after a few days was sure to be covered with bacteria ; he recommends corrosive sublimate.

I have great faith in peroxide of hydrogen; it is fairly easy of application, and one can positively tell when the tooth is aseptic, very often teeth are filled immediately after this treatment, and with success.

After a proper antiseptic dressing has been applied, the cavity should be filled up with temporary gutta-percha. If the tooth is a very bad one having, an abscess at its apex, this can entirely be done away with, a simple dressing of sponge placed in it, then after a few days it should be dressed again, this time inserting a plug of gutta-percha with a vent communicating with the canal, this allows gases and any secretive to escape.

After a third dressing the canal should be sealed entirely, and if all is well then, we know the root is ready for its permanent filling.

It is a good thing to paint the gum around the tooth with aconite and iodine, this allays all alveolar inflammation.

Sometimes the tooth is much discoloured, if the cavity is filled with chlorinated lime, the chlorine gas being liberated will bleach the tooth entirely.

We have now passed over the treatment of the teeth up to the point when we consider them fit for a permanent filling.

I will now enumerate some of the most used materials for filling the canals. Opinions differ very much indeed on this subject, some say gold is best, but can it be possible to get gold up a canal, so as to fill it hermetically right up to the apex. In my opinion, it is impossible, however great the care bestowed upon the operation, even when the canals have been drilled out.

Others use amalgams, wood, and gutta-percha points, any material that is in a solid state, is not nearly so easily to place up a canal, as one which is semi-fluid. Chloroform, and G. P., Oxychloride, oxy-phosphate, cotton and mastic, those all have their patrons, chloroform, and G. P. makes an excellent filling and is easy of manipulation, oxy-chloride is very good made up to the consistency of thick cream; there is one great objection to its use, and that is its aptitude to cause periostitis.

Oxy-phosphate, on account of its sticky nature, is hard to manipulate ; still, if the instruments are smeared with a little Vaseline, this is partially got over, if properly packed up the canal, it makes a much better filling than the chloride.

Mr. Tomes recommends celluloid as a root filling. He takes the thin sheets of celluloid, used to carry the sensitive photographic film. This is cut into thin strips, rounded by rolling and dipped into a strong collodion, to which camphor is added in the proportion of a drachm to an ounce. Wipe out the canal with absolute alcohol, the canal is filled up with collodion, and the strip of celluloid is inserted by means of plugging forceps, the celluloid being fairly stiff, and taking some time to soften the strip, can be worked fully up to the apex.

Then take some shreds of gun cotton on a fine bristle, and pass them up the canal; the whole now forms a pasty mass.

The advantages claimed for it are :—(1) That in the celluloid strip, something is introduced, the length of which is known, and it is never again withdrawn; this enables one to say the whole root is full. (2) That there is nothing at all approaching in pumping action. (3) That the material employed is antiseptic; and absolutely non-irritant.

Mr. Sewill thinks cotton wool and perchloride of mercury good. Is it air-tight ?

Looking at all these methods, it is difficult to say which is best; they all have their advantages, but for preference, I like chloroform and gutta-percha.

I must now thank you for your kind attention, hoping you will enlighten me on many points in the discussion which I hope will follow.

PROPHYLAXIS.

By J. Taft, Cincinnati, O.

Oral hygiene is a subject which every dentist perhaps imagines he understands quite well. It is a subject, however, that receives but little consideration in the literature of the profession, or in our discussions upon dental questions, and altogether too little in the actual practice of the average dentist. It is because of these facts I now ask your attention briefly to this subject.

The general failure to recognize the practical phase of this subject, is not because of a corresponding want of knowledge or want of ability to meet the emergencies, but it is due in a large measure to the neglect of the subject in our literature and discussions. There is very great lack of understanding and appreciation of the importance of this subject by the people generally, and so it is rare indeed to find any one with a mouth with all its parts in a perfect state of health and purity ; notwithstanding the fact, that upon the condition of the mouth and teeth, in a large measure, depend the comfort and welfare of the entire organism.

The processes of digestion and nutrition, in a large measure, depend upon the insalivation and thorough mastication of the food. This can only be accomplished when the masticators are in good condition, and this can only be maintained by intelligent care and attention : and the latter will only be exercised when there is a proper appreciation of the value of these organs.

Perhaps not more than one in twenty, in any ordinary community, succeeds in maintaining the mouth and teeth in a good condition of health and purity. This does not occur so much from absolute ignorance as to how it can be accomplished, as from want of appreciation of the importance of the subject; for it is quite practicable, and within the reach of every one who desires to maintain these organs in the best possible state of health, comfort, and usefulness, to secure a very great improvement over the average condition as presented.

And now, are there any others to whom responsibility attaches for this state of affairs? Can it be said that physicians, who are supposed to be the conservators of the public health, are much more appreciative than the common people?

Very seldom indeed is it that physicians give instruction to those in their charge, about the health and preservation of their teeth. The truth is, that usually the chief efforts of the physician are directed to the cure of disease, rather than to its prevention; notwithstanding the latter is vastly more important than the former.

May we ask how much care is exercised in respect to this matter, by physicians, each one for himself?

The want of attention to this subject of both special and general hygiene, on the part of the medical profession, is lamentably prevalent, to it vastly more attention should be given.

What shall be said in regard to the attitude of dentists in regard to oral hygiene? Are they not relatively as much in fault in this matter, as the general physician? How seldom is it that dentists are careful to instruct, and sufficiently impress upon the minds of those they may have in charge, the importance, the benefit, and the means of maintaining a good state of health of the mouth and teeth.

Is it not true that in a large proportion of cases, and may we not say a large majority, in which the dentists are called upon for remedial and restorative treatment, that they wholly overlook prophylaxis? How often is it that the operation of filling teeth is performed in a mouth having much disease, and a large amount of debris and impurities that ought to be in the first place removed.

How often is it that the dentist simply rests satisfied with performing an operation for repair upon a defective tooth or teeth, when the first thing that should receive attention, is a restoration to health and purity of the mouth in all its particulars, and the operations upon decayed teeth for restoration, should follow.

It will readily be conceded that when a patient is placed in charge of a dentist, for the care and preservation of the teeth, it is his bounden duty to do whatever will minister to the best interest of that patient; and this applies not only in respect to restoration, repair, and remedy, but also to prevention as well; the proverb, "Prevention is better than cure," applies here with great force.

While it is true that the active and manipulative work of the dentist is, in a large measure, devoted to repair and cure, yet he has, if possible, a greater responsibility and duty in aiding and directing his patient in such a course of health and habit, as shall most certainly ward off and secure him against disease.

Is it not true that patients, many a time, are dismissed from the care of the dentist, with the mouth in such a condition with respect to impurity, that the best work possible upon the teeth in the way of filling, is of but little permanent value? Every patient before being dismissed should receive such instruction, and be so impressed with the importance of the subject, that the habit of attention to the care of the mouth should be thoroughly established, and as persistently followed as that of sleep, or partaking of food. The dentist owes it to himself and his profession, as well as to his patient, to do whatever will lead to the greatest permanency and security of his operations.

No one at this day should be permitted to engage in the practice of dentistry without thorough knowledge and the best appreciation of dental hygiene, and all that pertains to it; every dental college should make oral hygiene one of the most important branches of its instruction. This subject should be more discussed in dental societies than it has been, and with a special reference to arousing attention in regard to it; this is perhaps more necessary than giving instruction as to methods of procedure; nevertheless, the latter is very important, and more should be written upon the subject.

In looking over the literature of dentistry there is but little found on this subject; a few brief articles, probably not over half a dozen, will be found in our periodical literature bearing directly on this subject, and few, if any, of these assume to discuss the question to any good degree of thoroughness. There has been enough written to fill volumes on "The Management of Pulpless Teeth", "Abscess Teeth"; "Supplying Artificial Substitutes," etc.; while the subject of oral hygiene has received but a word or a thought at long intervals. Our textual literature is well nigh silent on the subject of the maintenance of the mouth and teeth in a state of health ; they deal almost wholly with processes of remedy, repair, and restoration. This deficiency does not occur wholly from ignorance, for nearly all dentists, and many others, know full well the ordinary results of the neglect of the teeth and mouth. Time and space forbid that we here enter into a full discussion of oral hygiene. Is it not quite as necessary that we apply the knowledge we have of this subject, as to strive for more knowledge while we are not utilizing what we have ? I doubt not that three-fourths of the diseases of the mouth and teeth are preventable by a right application and exercise of the knowledge we have upon the subject of prophylaxis. There is, of course, much to be learned, and it is commendable to make all possible progress, but let us, by all means appreciate and apply the knowledge and ability we have ; if we possessed more light and knowledge, and made no better use of it than of the knowledge we already have, we would be none the better, but worse.

In the further crnsideration of this subject, I will ask your attention to one or two offensive conditions of the teeth, with which all dentists are more or less familiar ; all are familiar with the ordinary deposits and accretions that are found in the neglected mouth.

Perhaps the most simple and least excusable of these is a more or less vitiated mass of soft pasty matter, consisting of food material, thickened mucus, and waste from the adjacent tissues. This is usually found in greatest amount at and near the necks of the teeth, and beneath the margins of the gums, and between the teeth ; this material ordinarily undergoes putrefactive change quite rapidly. The character of this change, and the form which the material may assume, will be modified by the state of fluids of the mouth, by the character of the breath, and somewhat, donbtless, by the condition of the alimentary canal ; the change in this material will also be influenced by "mouth breathing" ; this evil habit tends to produce thickening of the mucus of the mouth by evaporation of its water , variation in thermal changes is also by this means induced ; foreign matter in the form of dust organisms, and whatever may be in the air, will be taken into the mouth by the " mouth breather." All this tends to hasten change of matter that may be lodged in the mouth; this variety of accumulation may be found upon all the teeth in the mouth, perhaps in larger amount, however, upon the buccal surfaces of the molars, and the anterior surfaces of the inferior incisors, and and oftentimes upon the labial of the superior incisors cuspids, upon the latter it is usually found in its most offensive condition ; upon the entire surface of any or all of the teeth this accumulation will often be found, and especially is this true of those not used to mastication. It will usually be found in its most offensive state where fresh saliva comes most in contact with it, and so, nowhere is it found more offensive than upon the labial surfaces of the superior anterior teeth. The influence of this material is injurious in several aspects or directions; it usually possesses a more or less marked offensive odour, due to its putrefaction, and this is often given to the breath ; and in "mouth breathers" this offensive condition will be carried to the lungs, as well as thrown out by the breath. This offensive matter also necessarily more or less mixes with the food, and is taken into the alimentary track ; this accumulation is usually more or less irritating to the margin of the gums, and to the mucous membrane.

In all cases where it exists in any considerable quantity at and beneath the margin of the gum, there will be an inflamed condition of the tissue, more or less pronounced, and of greater or less outreach according to the susceptibility of the tissues, and in many cases persistent suppuration of the margin of the gums is the result, and sometimes disease thus induced extends into the sockets of the teeth, causing more or less pronounced disease there.

The persistent presence of this material especially upon the buccal surface of the superior molars, and upon the labial surface of the superior incisors, is a fruitful source of decay of these teeth, and especially so where there may be defective enamel, or where it passes beneath the margin of the gum and beyond the edge of the enamel ; evidence of this destructive influence is shown by the fact that very rarely does decay occur upon the surface of these teeth when they have been kept wholly free from this deposit.

This accumulation is almost universally found upon the teeth of those who do not masticate as nature designed. Those who live upon pultaceous food, requiring little or no friction in the act of mastication, usually have this material in large quantities. Different kinds of food vary in their liability to undergo change ; some under a given influence will decompose rapidly, others under the same influence much less rapidly.

In giving directions for the hygienic management of the mouth, the things here referred to must be taken into consideration, viz., the habit of mouth breathing has its deleterious effects upon the mouth, the teeth, the throat, etc. The patient should be made to understand the influence of a vitiated breath, and to understand that there is always more or less of mischief in connection with it that ought to be remedied. Always when an offensive breath is present, it should be a matter of earnest solicitude on the part of the patient ; the condition of the alimentary canal oftentimes has much to do in vitiating the breath, and in inducing an abnormal state or condition of affairs, but a course of life should be adopted by the patient such as will change conditions for the better.

"The mouth breather" should contract the habit of keeping the mouth closed, and using the legitimate organ for respiration ; the best possible condition of the general system should be maintained by a full observance of the laws of health and hygiene, to this end, good and nutritious food should be used, mastication and insalivation should be thoroughly accomplished, all the eliminating organs of the body should be maintained in a most perfect condition, each one should be so managed and treated that its peculiar work will be well accomplished. To these conditions very little, if any, attention is given by the average practitioner of dentistry. The remark was not long since made, in the hearing of the writer, by a prominent dentist, that "he did not regard it as his duty, nor the business of a dentist, to cleanse the teeth from that which the patient himself could remove." Now, while in one sense this may be true, it does betray a want of appreciation in respect to this matter ; it is as important that the teeth and mouth receive attention in regard to purity and cleanliness, as that decayed teeth be filled, or that diseased gums, or alveolar abscess be treated.

A great many excuses are made for neglect in this matter, such as : "I have been sick, or not very well, and so my teeth have been neglected." Another, "I have been away from home and had not the opportunity to attend to my teeth" ; "I have not the appliances or preparations for keeping my teeth in good condition" ; "I did not know that there was anything objectionable or pernicious about or upon my teeth, or even in the mouth." Another says, "I have been so very busy that I had not time to give attention to this matter." How much influence any or all of these excuses ought to have, or will have with any one who fully appreciates the value or importance of a healthy mouth and good teeth, I leave you to decide.

Let us then, as we go forth in the exercise of our professional duties, use most efficiently the knowledge and resources we have. In time of peace prepare for war ; in time of health build barriers against the incursion of disease, and not wait till it is upon us, and then put forth efforts in meeting it, which are in so many instances fruitless and at best serve but a very temporary purpose.

From an inquiry into the physical and mental condition of school children, Dr. Francis Warner comes to the conclusion that cranial abnormalities appear to be the most important defects in development. The size and probable volume of the brain is of the first importance, and in a child the size of the cranium is a fair indication of this. He gives the following measurements as the normal circumference of the cranium of a well developed child :—at 9 months, 17.5 inches ; at 12 months, 19 inches ; at 7 years, 20-21 inches. Out of 50,000 children, 26,884 boys, and 23,143 girls, he found 327 boys, and 738 girls with small heads ; these may have an average mental faculty, but seem more liable to break down of the nervous system ; 257 boys, and 46 girls had large heads, mostly due to rickets. Asymmetrical heads were found in 100 cases, but did not appear to have any marked currelation with other defects. The palate was ill shapen in 1,331 children, standing next to the cranium, both in frequency and in a high correlation to defectiveness. The palate was examined in all children. The frequency of the various types has been given, but their relative correlation was not determined ; there were 22 cases of cleft palate in the 50,000 children.

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DRIVING HOME THE NAIL.

The Council for the plaintiff in the application, Partridge *v.* General Council of Medical Education and Registration, given on another page, could hardly have done a better service to the other side than when, in answer to the question of Lord Justice Lopes, "Would it not be disgraceful conduct for a barrister to advertise?" he answered, "We often see notices in the paper, that a barrister has joined a particular circuit, and conducts very like advertising." This was driving home the matter in a way which could not fail to make an impression on the learned judges, and it will not escape our readers' attention that it did do so, but in a way that Mr. Willis hardly could have desired, that is, we hasten to add, in his character as "Council for the Plaintiff," though it is possible that as plain Mr. Willis, his opinion would not be very different from that of the Master of the Rolls. Said the latter, "The plaintiff had on obtaining his diploma in Ireland, promised not to advertise while holding that diploma. That body considered that they should act fairly by each other, and not to advertise. Just as in our profession, where all are rivals against each other, a barrister is not allowed to advertise his superior talents, or that he will do his advocacy cheaper. I think if he did so, I should consider it such disgraceful conduct, that he ought to be immediately disbarred. No one need become a member of the dental profession unless he desires it. I say the authorities——have a right to determine if, it within reason, is or is not disgraceful professional conduct. In Ireland, the defendant had promised not to advertise, and having given that promise, according to his own evidence, he had spent more than £10,000 in advertising. This is his admission, and he continued to advertise, after he had received a warning from the College in Dublin. This must be evidence of disgraceful conduct in a professional respect, and ample evidence upon which the Council might exercise jurisdiction." We are not concerned with this particular case further than as it may apply to the question of advertising at large. Here then, we may take it, we have a distinct understanding that advertising by dentists is looked upon as distinctly unprofessional by some of the highest judges in the land, and, further, that if our examining bodies will but insert an undertaking, not to advertise in their diplomas, the diplomate will be held by these judges, guilty of disgraceful professional conduct should they break the contract, and consequently the Colleges and Medical Council will have their action supported, if they enforce the very obvious sequel to "disgraceful professional conduct." Many ways have ere now been started to check the undesirable practice of advertising. Education has done much. Some have tried to induce the public press to refuse such advertisements, together with those others concerning certain diseases, which are, to say the least of it, very bad taste ; we are afraid we can see no hope in this direction, for even if the chief papers should consent,the small fry would certainly not. Nor is any means at present to hand to induce them to do so; it is, however, a distinct gain in having their moral support, even though they may themselves countenance evil doing in their advertisement columns. Hence, we quote with pleasure the following sentence from a leaderette in a morning paper. "Dentists gain a distinct advantage by having their names registered, and there is no reason why the unwritten code, which forbids advertising in all other professions, should not extend to them also." It does extend, and has extended, for some time to dentists, though possibly the public have not realized this fact. We fancy, if we would only make them understand that those who advertise do so in direct opposition to professional feeling, and that those who do so, have no part or parcel in the inner professional life, that they are outsiders ; we say, we fancy if the public knew these things, they would show a little more discretion in extending support to such men. Perhaps this happy event may be somewhat hastened by the judgments of Lords Fry and Lopes, and the Master of the Rolls, and certainly we are indebted to the Council of the plaintiff for driving home the matter by his insinuation, that there are barristers who are guilty of "conduct very like advertising." Scarcely less disgraceful than such conduct, is that of a qualified man, who, though he does not advertise himself, yet acts as "assistant" to the man who does. Surely he is tarred with the same brush, and surely he breaks his contract not to advertise quite as much as if he did the deed himself. We fancy this is a matter, which as unqualified men become less numerous, will need the attention of diploma granting bodies, and a contract against this should also be inserted. Diplomas with such contracts are something more than mere qualifications, they are guarantees of professional character.

The Council of the College of Surgeons of England have appointed Messrs. Savory, Cadge, Macnamara, Willett and Rivington as a committee to consider and report to the Council "whether any, and if so what, further advantages can be extended to the Fellows." The advantages must of course partake of some increased participation in the management of the affairs of the College. This extension of grace, if it comes to pass, is to celebrate the fiftieth anniversary of the institution of the Fellowship of the College. In connection with this we may note that no further action is to be taken against those members of the College, who took part in an attempt to convene an illegal meeting for February 28th, 1889. The attempt of the members to obtain further rights in connection with College affairs has for the time met with no further success, and the result of the action Steele versus Savory has seemed to check further agitation for the time being. The costs of this action are said to amount to about £2,000 and as they were incurred for the members it is hoped these will also assist in helping to pay the bill.

The following is the suggested synopsis of Elementary Biology which is to form part of a medical student's curriculum under the five years scheme :—1. Chemical compositions and properties of protoplasm ; nature of cells ; cell division ; outlines of cell structure of chief tissues of plants and animals ; fertilisation and the early stages of development. 2. Unicellular organisms ; outlines of organisation and life-history of amœba, gregarina, vorticella, yeast plant bacteria, protococcus, and glœocapsa. 3. Chief differences between plants and animals. 4. Anatomy, life-history, and embryology of hydra. 5. Anatomy and life-history of the leech, liver fluke, tapeworms, and round worms. 6. General and distinctive characters of vertebrate animals. 7. Comparison of man's structure with that of other mammalia.

In a lecture at the Victoria Institute, Sir Joseph Fayrer has been calling attention to number of deaths in India, due to snake bites. In 1890, 21,412 human beings were killed, equal to one to every 10,155 of populations. Besides this, 3,948 cattle were killed, 510,659 snakes were destroyed at a cost of 19,004 rupees. The Cobra is the most formidable, but there are many others equally destructive to life. The cobra it will be remembered is one of the venomous colubrine snakes, snakes which have more than one tooth on the maxillary bones, and no one specially developed poison fang. Sir Joseph urges the need for reducing this mortality, by making known the appearance and habits of the poisonous snakes, and offering a reward for each snake killed.

A curious case of hematrophy of the face is recorded by Dr. Skyrme in the British Medical. It was the case of a girl aged 7. There was no history of previous disease or constitutional affection. At birth the face was natural, but at 3 years of age she got her head jammed in the bars of an iron gate, with an iron spike pressing under the chin, the head being rotated to the left and looking a little back. Beyond the pain caused by the twisting of the head there was no appearance of injury at the time, more than the loosening of a lower incisor tooth, nor was there anything wrong noticeable until six months later. The first evidence of the disease was a depressed yellowish seam on the cheek just below the right eye ; the lower teeth then began to fal out, and the cheek to fall in, the atrophy extending and implicating the skin, subcutaneous tissue, muscles, and the upper and lower jaw of the right half of the face, giving to the face the appearance of being made up of halves from different individuals,and the smallness of the jawbones making the affected side look smaller than the healthy. There is no loss of hair, nor is there any change in its colour ; the skin, which is very much thinner than on the opposite side, is drawn closely on to the bone, presenting depressions which do not exist on the unaffected side ; the ala of the nose is smaller and the lips thinner on that side ; the right half of the tongue is wasted, and when protruded points to the affected side. There is no marked difference in the halves of the palate ; taste and sensation are unaffected, the muscles have undergone no change either in their electrical reactions or voluntary control, but the spot touched by the electrode flushes up in a very marked way.

Certainly a new method of electing a Professor is that adopted by the Rush Medical College of Chicago. Being in want of a Professor of Pathology, they have left the election in the hands of Professors Virchow, Koch and Metschnikoff.

We are glad to notice that both the London and the National Dental Hospitals have, with many other charities, benefitted by the will of the late Sir Charles John Wingfield, late M.P. for Gravesend. The former receives £100, the latter £50.

Abstracts of British & Foreign Journals.

FRENCH DENTAL JOURNALS.

In *L' Art Dentaire*, an extraordinary case of *acute and persistent cocaine poisoning*, is rendered by M. Hallopeau. The patient, a professional man, aged 48 years, came to Dr. Aguilham de Sarran, on the 7th March, 1890, with violent toothache, which was found to proceed from the 2nd left lower molar. In order to avoid giving his patient pain in cutting out the decay, &c., M. de Sarran decided to employ Cocaine. He made a solution of 1 centigramme (about $\frac{1}{6}$ of a grain), of the Hydrochlorate, in boiling distilled water, and injected it slowly. Some of the injection escaped into the mouth, only about 8 milligrammes of the drug actually being injected. After waiting 3 minutes, and all pain having disappeared, M. de Sarran began to operate, but at that moment the patient was seized with fearful praecordial pain, and feeling of suffocation with presentiment of death; these are the usual symptoms of acute cocainism. Fearing syncope, M. de Sarran made the patient lie down quite flat, but instead of syncope, violent agitation came on. At this moment, 10 minutes after the injection, the pulse was thready, and so rapid, that the beat could not be counted, the patient became very excited and violent, shouting out, striding up and down the room, striking out with his arms, and smashing a lamp globe. This state lasted about 10 minutes; he then became quieter, and a dressing was inserted into the tooth. The patient got up and walked home unaided. He, however, felt quite prostrate, and from that time, functional troubles occur, which continue for several months. The following night his sleep is disturbed, he being restless and constantly waking. He has severe and constant headache. On the morning of the 9th, while at home in his office seated at his desk, he has the same sensations as after the injection. Dr. Piedvache, called to see him, finds him walking about rapidly in his room, pale and anxious looking, eyes staring, pupils a little dilated; patient cannot keep still, and has apprehension of death; pulse frequent, small, and compressible. After a few inhalations of ether, the pulse gradually regains its normal force and frequency.

He remains affected all day, but can go out and attend to some business; his appetite is good. During the next few days, he becomes very impressionable ; he is easily excited, and irritated ; he can with difficulty collect his thoughts, and attend to his clients' affairs ; he feels constant malaise, has bad nights, all intellectual work becomes impossible, he cannot even do the most simple sum in arithmetic, he has suicidal tendencies. On Saturday, the 22nd, fifteen days after the operation, he has an attack of faintness in his office, whilst talking to a client. The next day, he has a fresh attack of faintness and vertigo, lasting three hours. On being called to see him this time, M. Hallopeau found him in a state of extreme prostration, pale, faint, and at the same time excited, his countenance showing anxiety and depression ; he cries, and has presentiment of death. Professor Hardy called in consultation, considered it a case of veritable poisoning of the brain by cocaine ; he prescribed bromide of ammonium in 4 gr. doses, and alcohol to combat the insomnia. On the 6th of April, he was again seen by Messrs. Hardy, Mesnet, and Hallopeau, the diagnosis is confirmed, 1 gr. doses of Hydrobromate of Quinine is prescribed with Chloral for the insomnia, plenty of exercise, and a change in the country. From that time the vertigo and faintness disappeared, but for several weeks the patient remained in a bad state, despondent, unable to work, with continual headache and sleeplessness, but appetite remained good throughout. These symptoms gradually but slowly disappeared, and in 3 months' time, he recovered his former state of complete health, and has continued so ever since. M. Hallopeau then goes on to argue against those who averred that the symptoms were due to a neurotic state, by comparing them with those of cases in which large doses had been taken, and which were clearly cases of cocaine poisoning.

Dr. THOMAS contributes an article to *L'Odontologie* on *Malignant Tumours of the Lips*, in which he gives some interesting statistics of the frequency of Carcinoma in this position. Taking first cancers on the whole body, it was found that 20 in every 100 were situated on the face. The frequency of cancer of the lips relatively to that of other parts of the face is also high ; Winiwarter gives 37.01 per cent, Trendelenberg 51 per cent. If we reckon the relation of these numbers with the total numbers of cancerous affections, we find that the relative frequency of carcinoma of the lip to that of carcinoma of all the other regions of the body varies from 7 to 10 per cent. The lower lip is attacked more frequently than the upper, thus in 305 cases recorded by Börner, only 16 were of the upper lip, while Maireg records 34 cases in 400. Heurtaux declared that the disease was ten times less common in women than men, and in the former the upper lip was most often attacked, though this statement does not seem to have been so far confirmed. In considering the causes actual and predisposing, Dr. Thomas says it is difficult to attribute the predisposition of the male sex to the habit of smoking, and he comes to the conclusion after examining the statistics of various countries that there is a predisposition to the disease in the male sex apart from any habit. Thus, for instance, the percentage of females attacked is greater in Switzerland, where the women never smoke, than it is on the coast of Brittany, where a great number of the women smoke short pipes.

M. VIAU contributes an article to the same Journal on the *Septic Action of Tartar in the production of Gingivitis*, in which he says, "We are far from denying the direct influence of general health on the production of gingivitis, but we think that the active and producing cause is tartar." He lays great stress on the difference between the hard tartar composed chiefly of organic matter, desquamated epithelial scales, debris of food, micro-organisms, &c., not tartar in the true acceptation of the term, but a seething fermenting mass with a permanently acid reaction. He considers that the mechanical irritation of tartar has little effect in the causation of disease, as shown by the harmless collections of hard tartar in healthy mouths, but that we must look for the cause in a chemical irritation due to the septic condition of this form of tartar. In proof of his contention, he says, "Everybody knows that tartar is chiefly deposited on the lingual surface of the anterior part of the lower dental arch. There is hardly a mouth without tartar in this position, and yet, what do we see in practice? Gingivitis begins always in the anterior surface of this region, although the deposit of tartar there is notably less than it is at the back. This difference of susceptibility is easily explained, when one recalls the anatomical conditions of the part. The lingual surface of the front of the lower jaw is being constantly cleansed by the tongue in its movements, hence no lodgment is afforded for food or other debris to decompose, whereas in the labial surface there is no such force at work, food or other debris can collect there with great facility, unless carefully cleansed away with a tooth-brush; fermentation and septic changes which take place at this spot, irritate the mucous membrane and cause it to become inflamed and then ulcerated, followed by atrophy of the gum, absorption of the alveolus, loosening of the teeth, &c. These disorders are not observed where a tooth-brush is used carefully and regularly every day.

At the Odontological Society of Paris, M. FRANTZ exhibited a little *apparatus for facilitating the dressing of root canals.* It takes the form of a little metal funnel, with an everted edge; it also has two little rings on each side, through which silk is passed and fastened to the neighbouring teeth. The opening of the canal is coned with a bur, and the instrument is held in place with a little wax, assisted by the silk as mentioned above. M. Frantz claims for it that by its aid, roots especially those decayed below the gum can be more readily, and thoroughly dressed and medicaments, or the red hot wire for drying the canals, can be more thoroughly applied to the special portion of the canal.

DENTISTRY IN SCHOOLS AND THE PUBLIC SERVICES.

For some years the British Dental Association has been calling attention to the neglect of the teeth of pupils at district, infirmary, and other public schools where the children of the poor are educated, with the desire that skilled attention shall be provided for the teeth of all children under the care of such public bodies.

The appointment of skilled dental surgeons would lead to diseases of the teeth which exist in such schools being adequately dealt with, and a large amount of both local and general suffering prevented. Messrs. R. Denison Pedley and Sidney Spokes, acting on behalf of the British Dental Association, anxious to provide this Association with statistics upon which it can take action, asked and received permission to examine the mouths of the 1,000 children at the Central London District Schools at Hanwell, and at the request of the Board of Management have furnished a report which is now before us. The number of teeth examined amounted to some 20,000, and the statistics occupied four months in compilation. Of the temporary teeth 1,119 required stopping and 745 extracting: of the permanent teeth 1,222 required filling and 271 extracting; there were, therefore, as many as 3,357 unsound teeth present in the 903 mouths examined, while over and above this 83 mouths required the teeth to be regulated by mechanical means. There were only 137 mouths in which the dentition was sound.

It has been proved beyond cavil that much pain and suffering is spared those children whose teeth, whether temporary or permanent, are treated and carefully watched during the period of teething and early life. The following observations and suggestions are made in the report:

"There is an increasing recognition of the importance of a systematic care of the teeth, apart from any æsthetic consideration. In the case of children, who during the growth of the body have not merely to maintain nutrition, it is surely a matter of urgency that all the organs of digestion should be kept in a state of functional integrity, and if, as seems to be the case, diseases of the digestive tract are increasing, it is evident that any departure from the normal dentition places the child and the future adult at a disadvantage. Instead of waiting until a child suffers pain, and thus directs attention to a decayed tooth, it is far better for both patient and operator that the earliest appearance of caries should be noted, and the progress prevented by a regulated system of inspection and prompt treatment. Under such circumstances, dental disease and the necessity for painful operations become reduced to a minimum, and at the same time the function of mastication is retained in accordance with what is now recognised as the most beneficial practice. Referring once again to the figures, we would point out that 766 children have between them 3,357 unsound teeth, 1,222 of which are permanent teeth requiring filling. This points the way so clearly, that we have no hesitation in recording our opinion, that a duly qualified dental surgeon should be appointed to your school, and after careful consideration, we append the following suggestions with reference to such an appointment:—That in order to cope with the disease of the teeth at present existing in the school, it is advisable that the dental surgeon should attend once a week, (morning and afternoon), for at least two years. That an inspection of the children's mouths be so arranged that each would be examined twice during the year, new cases being seen at the first visit after their arrival. That a record be kept of all operations performed at each visit, and a report presented to the board. That the board should pay a salary of at least £100 per annum for the first two years, and provide the following :—Dental chair (say) £7 10s. ; dental engine (say) £7 10s. ; stopping materials (say) £5 (annually.)

These suggestions will command the general support of the medical profession, and bodies charged with the care and welfare of children would do well to appoint dental surgeons.

In addition to the work above referred to, we understand that the British Dental Association has also called attention to the neglect of the teeth of soldiers and sailors, particularly recruits. In the army we understand that no steps have yet been taken, but some naval surgeons, at the suggestion of Director-General Dick, are acquiring dental experience at the various general and dental hospitals with a view to subsequently educating naval surgeons in this department of practice. This is a step in the right direction, but it is not sufficient. Skilled dental surgeons should be appointed at all recruiting stations and training ships, because a course of instruction extending over a few months cannot prepare the general surgeon to treat the manifold varieties of dental lesions. The recognition, and discovery of early caries, is very essential, and this is only obtained, like skill in any other department, after much experience. We venture to hope that both departments of the services will shortly make the necessary alterations in their methods of dealing with the dental troubles of both soldiers and sailors.

British Medical.

PRESERVATIVE TOOTH-POWDER.

Precipitated chalk...	750 grains	Camphor	5 grains
Cabonate of magnesia	28 „	Oil of peppermint ...	50 drops
Borax	30 „	„ cloves	25 „
Powdered almond soap	250 „	„ lemon	25 „
„ orris ...	76 „	„ eucalyptus ...	25 „
Thymol	1 „	Creosote or carbolic acid	10 „

Mix the powders thoroughly. Dissolve the thymol and camphor in sufficient spirit, and add ; then also the rest of the ingredients, and mix well together.

SUPPURATION IN THE ANTRUM OF HIGHMORE.

By A. Brown Kelly, B.Sc., M.B.

I propose to contrast the two aspects under which empyema of the antrum may appear, and then to sketch briefly the symptoms, diagnosis, and treatment of the more obscure form.

If we consult any surgical work, with the exception of a few of those most recently published, we find empyema of the antrum described as an affection which presents the following as its most striking features :—Pain in the infra-orbital region, with inflammatory swelling of the soft parts, distension of the antrum manifested by bulging of one or more of its walls, and perhaps a purulent nasal discharge when the patient lies on the healthy side. If the disease go on unchecked, it may lead to exophthalmus, nasal obstruction on the same side convexity of the corresponding half of the hard palate, and on examination, fluctuation and crackling of the anterior wall may be detected ; ultimately the contained fluid may force an exit, and a fistula be established.

The natural opening between the nose and the antrum, under normal conditions, allows of the passage of air and of fluids—at least in small streams—from the one to the other. If, however, all communication between them be interrupted, and suppuration going on within the antrum, the pus will be retained. If the suppuration persist, the pressure caused by the gradual accumulation of the pus will be marked by the signs I have just mentioned.

This, then, was supposed to be the only course an antral suppuration could take, when, in 1886, Ziem* published an important paper on the subject, and showed that if the natural opening of the antrum be free, a suppuration may be going on within the cavity unaccompanied by a single one of these recognised signs.

A patient suffering from that variety of antral suppuration described by Ziem, may seek relief from either a doctor or a dentist, according to the most distressing symptom. If he consult a doctor, it is usually on account of a unilateral, purulent, nasal discharge. On questioning him, the other discoverable symptoms are probably frontal headache, loss of appetite, and impairment of the general health. In most cases a history may be obtained of an affection of the first or second molar tooth, or of one of the bicuspids of the corresponding side of the upper jaw. On the other hand, toothache may be so severe as to make all the other symptoms appear trivial in comparison, and the patient at once seeks the assistance of the dentist.

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* Monatsschrift f. Ohrenheilkunde, Nos. 2, 3, 4, 1886.

Although etiologically these two forms of antral affection are, as far as we know, the same, still they differ so much in their course and results, that it would be well to have distinguishing terms for them. I shall therefore confine the name empyema of the antrum, to that variety which originally was so designated, and which may be described aphoristically as pus in a closed cavity. To the more recently discovered form, in which there may be said to be a pus-containing cavity with a free exit, I shall apply the term, suppuration in the antrum.

While empyema is a rare affection, and fraught with danger of facial disfigurement, and even of death (Heath),* suppuration in the antrum with free escape of pus is by no means uncommon, and although not menacing life, still, by the discharge—which may persist for years—of foul-smelling pus, the patients existence is rendered miserable and his health enfeebled.

In this connection I cannot do better than refer to Ziem's own illness, which he describes in his paper. In 1877 he commenced to suffer from a fœtid, unilateral, nasal discharge. Various remedies were applied to the nasal mucous membrane, but these, as well as internal medication and a stay of two years in Egypt, failed to produce any improvement. In 1883 the discharge became so profuse, and the stench so marked, that the necessity of giving up his practice became more and more urgent. He now decided to have the antrum opened as the first step in a thorough search for the source of the suppuration. The doctor whom he requested to perform the operation was very unwilling to undertake it because none of the recognised signs of empyema were present. When, however, the cavity was opened and washed out, a large quantity of pus came away. Finally, a complete cure was obtained.

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* Injuries and Diseases of the Jaws (third edition, 1884), p. 164.

Etiology and Pathology.

The origin of suppuration in the antrum can occasionally be traced to a nasal catarrh. In such cases, the inflammatory process probably extends through the opening into the cavity, where, as a result, an increased secretion takes place. Owing to the orifice being at the upper part of the cavity, fluid accumulating within, can only escape when its surface reaches this height, or a foramen accessorium—if such be present, or when the position of the patient's head is such that the orifice is at a lower level than the cavity. It sometimes happens, however, that the opening being small, it becomes completely closed by the surrounding swollen mucous membrane. If this takes place, and if the contents continue to increase and are unable to find an exit, the signs of empyema are gradually developed. In any case, the retained secretion in the course of time undergoes putrefaction, and contact with it causes still further irritation of the mucous membrane, so that ultimately a "pyogenic membrane" is formed. Under such conditions, although the contents be evacuated and the cavity thoroughly washed out, pus will continue to be formed.

The normal secretion of the lining membrane of the antrum may be bottled up, undergo retrograde changes, and the same vicious cycle be established as above described, if from any other cause, *e.g.*, polypus or hypertrophy of the middle turbinate, the opening be closed and the respiratory current prevented from passing in and out, and removing the moisture as it is secreted.

A few cases* have been reported in which pus in the ethmoidal cells passed along a pathway, either normally present or formed by the breaking down of intervening partitions, into the antrum. Thence it escaped by the antral orifice, thus simulating an antral suppuration.

Analogus cases doubtless occur in connection with the frontal sinus.

Perhaps the most frequent cause of suppuration in the antrum is dental disease. If we examine the antrum in a number of anatomical specimens, we find the floor occasionally presenting rounded elevations. These correspond to the roots of the teeth—usually the first or second molar, or second bicuspid. In such cases the bone covering the fangs may be very thin, or even absent, so that the tooth is separated from the antrum by periosteum and mucous membrane only. Disease attacking a tooth so situated, would be almost certain to induce pathological changes in the neighbouring lining membrane.

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* Macdonald, Treatise on Diseases of the Nose, p. 168 ; and "On Cyst and Abscess of the Middle Turbinated Bone," Lancet, 20th June, 1891.

As rare causes of suppuration in the antrum may be mentioned : blows on the cheek, the stump of a tooth being forced into the cavity during attempt at its extraction, introduction of foreign bodies by violence or after extraction, section of the infra-orbital nerve by Malgaigne's method (Lagenbeck),† pressure on the face of an infant during parturition (Rees,‡ Spencer Watson§).

SYMPTOMS,

The patient may complain of only a single symptom—viz., a purulent discharge from one nostril. Occasionally there is suppuration in both antra, and then naturally there is a discharge from both sides. Under ordinary circumstances, however, when one antrum is affected the flow is unilateral, unless it be abundant and pass round the posterior edge of the septum into the other nasal cavity.

As a rule, the pus escapes anteriorly ; it may, however, pass backwards into the throat, and give rise to a disagreeable taste, and in the course of time to loss of appetite and digestive derangements.

The flow is intermittent, and its onset may be sudden and unaccountable. Often this is determined by the patient assuming a position which favours the escape of the pus—*e.g.*, holding the head low, or lying on the side opposite to that diseased.

The pus may be odourless or it may have a strong smell, which has been compared to that of stinking herring. If it be of this character, the patient will perceive it when the discharge passes from the antrum into the nose. To a bystander, the smell is not apparent, unless he inhale the air as it issues from the patient's nose. Herein the disease presents a striking contrast to ozæna, in which the patient, having lost the sense of smell, has no idea of the horrible stench proceeding from his nose.

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† *Arch. f. Klin. Chirurg.*, Bd. xi, 1869, p. 127.
‡ *Medical Times and Gazette*, N.S , vol. iv., p. 860.
§ *Diseases of the Nose* (1890), p. 164.

The symptom next, in point of frequency, is probably headache. This is usually described as a dull pain or as a feeling of pressure, and is referred to the supra-orbital region on the same side. In a number of cases this pain has a peculiar periodicity. It is present when the patient gets up in the morning, increases till the forenoon, and then gradually dies away during the remainder of the day. When this symptom is taken in conjunction with the purulent discharge from the nose, one not unnaturally suspects a suppuration in the frontal sinus. Such an affection may possibly co-exist, but it is more probable that the pain located over this cavity is due to a closure of the passage leading from it into the nose, by a swollen condition of the lining mucous membrane. As a consequence, the air within the cavity is shut up and ultimately absorbed (Killian)*. This theory is supported by the fact that the headache is often dispelled by the use of Politzer's air douche.

Occasionally mention is made of some present or past dental trouble on the corresponding side of the upper jaw, which the patient associates with the onset of the antral disease.

On making an examination of the nasal cavity on the affected side, pus is usually seen. In order to find its source, the mucous membrane should be cleansed with a spray or other suitable means, and the patient then directed to hold his head low, and thus allow the contents of the antrum to pass into the nose (Bayer).† This procedure serves also as a means of differentiating antral from frontal sinus suppuration, for if there be fluid in the frontal sinus, it will be unable to escape owing to the position of the patient's head. After a short interval, the nose is again examined, and in all probability pus is found lying in the middle meatus, where the opening into the antrum is situated (Fraenkel)‡. As to the state of the nasal mucous membrane, in some cases it is congested, or hypertrophied, while in others it is perfectly normal. Occasionally some diseased condition is found which may account for the antral disease, or result from it—*e.g.*, polypi, or enlargement, or polypoid degeneration of the middle turbinate (Bayer* Hartmann.†

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* *Monatsschr. f. Ohrenheilk.* (November 1887,) p. 322.

† *Deutsch. Med. Wochenschr.*, No. 10, 1889.

‡ *Berl. Klin. Wochenschr.*, No. 16, 1887.

From the foregoing brief account of the symptoms, it will be seen that, with the exception of the first—the unilateral discharge of pus from the nose—and the finding of pus in the middle meatus, they are of little assistance in helping us to make a diagnosis.

But even these may be absent, as in the case of a lady who consulted me on account of *something coming into her throat* while singing, so that she required to pause for a moment to clear her voice before being able to proceed. She had noticed this since she had commenced to practise singing, about a year previously. Examination of the upper respiratory tract revealed no condition which could account for the symptom. The only pathological change to which any importance at all could be attached, was a small polypoid growth beneath the right middle turbinated body. This I removed. On subsequent occasions, I cauterised the lower edge—which had become polypoid--of the right middle turbinated, and snared other too small vegetations, apparently of the same nature as the first, and which successively occupied its original site. In spite of this treatment, which was carried out at intervals during a period of about two months, the symptom of which the patient complained remained unaltered. I had for some time suspected disease in the right antrum, but had never felt justified in aspirating the cavity, because after repeated examinations I have failed to find any trace of pus in the nose, even after the patient had held the head low, or in the naso-pharynx. An occasional bad taste in the mouth was the only indication of the presence of a purulent discharge. Nothing unusual had been observed in the character of the nasal secretion blown into the handkerchief, nor had the amount appeared to differ on the two sides. The patient had certainly suffered considerably from frontal headache, but neither this nor the fact that she had been a good deal of late in the dentist's hands was of much assistance in settling the question as to whether or not the antrum was affected. Transillumination —a method of diagnosis which I shall afterwards describe— also proved of but little service, both sides being darker than usual, and about equally so. In order to set at rest the doubt which had arisen, chiefly in consequence of the rapid recurrence of the vegetations in the middle meatus, I aspirated the right antrum by Schmidt's method (*vide infra*), and drew off pus. On washing out the cavity, a comparitively large quantity of thick, clotted, odourless pus was driven through the normal orifice. It is now a week since a passage was made through the alveolar border for the drainage of the antrum, and during that period the headaches have been milder and the bad taste less frequent. I am unable to say whether the "something" in her throat was caused by the purulent discharge itself, or was merely a sensation induced by the long continued trickling of the pus over the mucous membrane of the pharynx.

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* *Deutsch. Med. Wochenschr.*, No. 10. 1889.

† *Ibid.*

On the other hand, the symptoms may point so strongly to antral suppuration, that if one trust entirely to the patient's statement, and overlook the objective conditions, he may be easily misled and make an error in diagnosis. I may mention a case brought to me by Mr. W. H. Woodburn bearing on this point. When I saw the patient he had a discharge of "dirty matter and blood-clots" from the right nostril for a fortnight. The flow was increased by holding the head down. or when lying on the left side. There was slight pain over the right cheek. He had suffered severely from toothache and Mr. Woodburn, finding the second upper bicuspid on the right side diseased, had extracted it. On making an examination of the nose no pus was seen. A slight ulceration of the cartilaginous septum on both sides accounted for the blood. Transillumination and aspiration of the antrum yielded negative results. I therefore concluded that the case was not one of suppuration, as I at first suspected on hearing the patient's account, but of catarrh in the antrum. The source of irritation—the decayed tooth—having been removed, all the symptoms rapidly subsided.

DIAGNOSIS.

A certain and convenient means of diagnosing antral suppuration still remains a great desideratum. Several methods have been devised, but of these not one is in all cases absolutely trustworthy, and at the same time easy of application.

A very ingenious method is that of transillumination. In a paper published in 1889, Heryng* describes the instrument required and the method of using it. A small incandescent lamp is fixed on the upper surface of a tongue depressor. The room is made perfectly dark. The patient himself holding the instrument, presses down his tongue with it sufficiently to keep the lamp from touching the palate, and then closes his mouth. If the current be now established, and the film rendered incandescent, light shines through certain parts of the face, and produces corresponding areas of redness. Round the mouth and over the cheeks this redness will be seen, but what we have specially to observe is the crescentic tache beneath the eye, which is produced by the light passing through the antrum. The intensity of the redness over this region varies greatly in different individuals. When the antrum is small and the bony walls thick, or when the fleshy parts are dense, the tache will be less marked, and *vice versa.* If both antra be healthy, *ceteris paribus,* the redness should be equal in intensity on both sides, but if one side be dark and the other bright, we suspect disease on the dark side. The pathological conditions which may prevent transillumination are—an accumulation of pus, or a solid growth in the cavity, or a thickening of its lining membrane.† If these were the only causes of unilateral darkness, the method of transillumination would deserve the foremost place amongst our diagnostic tests on account of the ease with which it can be applied, and the non-necessity of a special training to interpret the results. Unfortunately, however, it is rendered unreliable because in a small proportion of persons the antra are not symmetrical. On the one side the cavity may be large, with thin walls, while on the other it may be small or almost absent, and the walls very thick. In such a case there would be a corresponding difference in the transillumination on the two sides, and if we had been led to suspect antral disease on the side which turned out to be dark, we might proceed to operate if we trusted to this method alone.

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* *Berl. Klin. Wochenschr.*, Nos. 35 and 36, 1889.

Under favourable circumstances the eye itself may be transillumined, when its movements may be followed by watching the red pupil. While employing this test, I usually ask the patient to close the eyes and tell me whether any redness is then discernible. Frequently nothing is perceived ; occasionally however, it seems as if the interior of one or both eyes were lit up by a dull, red glow. In almost all the cases in which I have found absence of the antral tache on one side—whether from the presence of pus or from other causes—the patient has reported a perception of light on the bright side and an absence of it on the dark.

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† Darkness of the affected side persisting—as it usually does—after the evacuation of the pus is probably due to thickening of the lining membrane.

Distension of the antrum may be caused by pus or growths in the cavity. When due to pus it does not usually reach a great size owing to a fistula forming at a comparatively early stage. On the other hand, when caused by a growth, the distension may become very considerable. Further points of distinction are to be found in the mode of onset and course of the two conditions. In transillumination the surgeon has a convenient means of distinguishing a cyst from a solid growth. In the case of a cyst with serous contents, the thin walls and fluid promote the transmission of the light, whereas a solid growth completely prevents it. To form a diagnosis, and to indicate the treatment necessary, this method is therefore invaluable ; for, while cysts in the antrum require merely to be tapped, solid tumours, being usually of a sarcomatous or carcinomatous nature, demand, when suitable for operation, resection of the superior maxilla.

Cases are on record in which this severe operation has been nedlessly performed, owing to a cyst or an empyema having been confounded with a solid growth, and the first case in which this test of transillumination was employed would have added another to the list of mistakes, had the patient not refused to submit to the operation. Thereupon, Voltolini determined to try electrolysis. Before doing so, however, having been engaged for some time with experiments in the transillumination of the larynx, he applied his method to the antrum, and was not a little astonished when the whole tumour appeared transillumined in the most beautiful manner. In spite of this he thought that he had still to deal with a sarcoma, so he proceeded with the electrolysis. Next morn- he learned that a great quantity of fluid had escaped through the puncture made by the electrolysis needle, and on examination he found that his supposed tumour was represented by a large cavity.

(*To be concluded*)

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* Liston, *Operative Surgery*, p. 302; Heath, *op. cit.*, *Hydrops Antri*, Marchant, *Bull. de la Societé Anatomique de Paris*, February, 1889, (Abstract *in Jour. of Laryngol and Rhinol.* 1890, p. 164).

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual Monthly Meeting of this Society, was held on Friday, March 4th, at 8 o'clock. The chair was occupied by W. Robinson Humby Esq., *President.*

The minutes of the previous meeting were read by the Hon. Secretary (Mr. C. Bascombe), and confirmed.

About 50 Students and visitors were present, the latter, receiving a formal welcome from the President.

The following gentlemen were elected as members of the Society :—Messrs. Woolf, Reece, and Bradshaw. Mr. Robertson was nominated for election.

The President, in welcoming the visitors of the evening, expressed his pleasure at seeing amongst them, students from the Dental and Guy's Hospitals, and he hoped he might have the pleasure of seeing them at future meetings, thereby establishing the harmony which ought to exist amongst all Schools.

Under the head of Casual Communications, Dr. Maughan, narrated a case of Abscess of the Brain, in which a girl, 17 years of age, at first complained of severe pain over the right eye and right side of the forehead. It was found that she had one or two carious teeth, and she was told that they must be the cause of the pain, and after having the teeth extracted and taking some patent medicines, she jogged along pretty comfortably for some time, but eventually the pain continued, and about a fortnight before she died, she went to a Hospital. The Physician asked her what was the matter, and she told him she had a very bad headache on the right side of the forehead, and a slight discharge from the ear. "Go and see the doctor," he said, giving her a card with the name of the surgeon on. When he saw her, he examined her, and diagnosed the case as a "polypus of the right ear," and put her under treatment; she again very much improved by this, and in a few days her mother thought she was cured, but even then she used to wake up at 1 or 2 o'clock in the early morning with a severe headache. One day, however, soon after this she went about the house as usual, performing her domestic duties, and then went to bed and about 2.40 in the morning she woke her mother, and immediately the girl fell back with a gurgling sound and died. The Coroner communicated with the surgeon who had seen her, but he could give no satisfactory reason of the cause of death, so Dr. Maughan was ordered to make a post-mortem. "On opening the skull," Dr. Maughan continued, "I found that the right side of the brain had been ploughed up from beneath by a rush of pus, under the right side of the cerebrum. I found a little body about the size of a pigeon's egg. It was an abscess sac, the roof of which had been recently ruptured, and through this rupture the matter had escaped. I opened the sac, the probe passed through the carious roof of the tympanum and out through the external ear. Speaking to those who are interested in anatomy, you will see a little body of soft tissue emerging from the stylo-mastoid foramen, and which you will recognise as the facial nerve. The polypus, which the surgeon saw, was some granulation tissue ; but there ought to have been giddiness, vomiting, optic neuritis, and continual, rather than periodic pain. Any one of you may have a case like this to deal with. The only thing that she complained of, that required an urgent remedy, was the pain over the right eye. It is easy to see now that the extraction of carious teeth was utterly futile in the successful treatment of this case."

The **President** said that he had seen a similar case and such a thing might fall into the hands of any one of them. He did not think it was possible to give a correct diagnosis of such a case as that, therefore any one would be quite justified under the circumstances, in removing any decayed teeth that might have been present.

Mr. **Spokes** understood Dr. Maughan to say that there had been a discharge from the ear for some time, and if this had been draining the carious part of the petrous portion of the temporal bone it was not easy to understand why the abscess had burst in another direction. Of course the fistulous tract may have become stopped up. Perhaps with the desire to be brief, Dr. Maughan had not told them the condition of the other important organs of the body. No doubt he had examined the heart, and one would be glad to know if there was any condition there which might have caused sudden death.

Dr. **Maughan** said that if Mr. Spokes had seen the abscess sac and the way in which the brain had been suddenly compressed by the escape of pus, he would have had no doubt as to the cause of death. Probably the membrana tympani was blocked, save what would allow slight oozing.

Mr. L. Read, from Guy's, asked whether, upon making a close examination, they could not see that it was not a polypus? Why was she not examined for neuritis?

Dr Maughan: I am very sorry that she was not examined for optic neuritis, still there appeared to be no symptom of anything serious from beginning to end. There was, as I said before, simply a headache with a slight discharge from the right ear. The autopsy revealed the fact that all other organs were perfectly healthy.

The President referred to a similar case in his own family, where great pain was experienced in the cerebellum, with a tendency to paralysis, caused by a few drops of blood escaping from the vessels.

The President then made a few remarks with regard to Dr. Cunningham's method of making use of thin German silver matrices for the purpose of supporting the amalgam during the process of hardening, and which should be left on the tooth for at least 24 hours.

A specimen illustrating this method was passed round for inspection.

Mr. Clark expressed himself as not being in favour of this particular method.

The President then called upon Mr. Woolf for his paper entitled "Porcelain-faced crowns with collar attachment," which appeared in our last number.

A great number of instruments and specimens of his work were handed round, and many diagrams (illustrating the various stages of the process) decorated the walls.

The above interesting paper was received with great applause.

The President said that Mr. Woolf had informed him that should any of the crowns, which were being examined by the students, become stretched, they could easily be made tight again by means of the "Reducing plate." He thought if they had never attempted crown-work before, they might do so at once and do so successfully after having listened to the able manner in which Mr. Woolf had so thoroughly explained his method.

Mr. Rushton opened the discussion by saying that he thoroughly agreed with Mr. Woolf that good instruments should be used for root filling. He knew a gentleman who failed in three things when doing crown work,—he had not filled the apex of the root; his pin was not as long as his root canal, and he had soldered his pin on the inside. There was one thing against crown-work, and that was it was a very painful process. There was one system of crown-work which had not been touched upon by Mr. Woolf, and that was using a saddle-back bicuspid, having the back quite flat and backing with gold, it has no gold showing at the cutting edge, and very little at the root.

Mr. L. Read: The treatment of roots is a most important matter, as if one does not succeed in getting them perfectly antiseptic, the patients are sure to return to us within a short time. The removal of the enamel is also a very important thing, by so doing one gets the sides of the teeth more parallel; some of the chisels which I have seen for this purpose are very useful, they have a broken back with the cutting-edge on the side, instead of at the end of the chisel. With regard to fig. 11, (referring to one of the diagrams) Dr. Lovejoy of Philadelphia showed me how he took the outline of the root with a piece of wire; he takes a little block of soft wood, and hammers the wire on to the wood, then he takes his impression, trims off and then fits his crown to that. This is a more rapid process than any I know of.

Mr. Willoughby Weiss: As a matter of fact, Mr. Woolf has touched upon almost every method of crowning. I find that you must select your cases. Where you want to have successful crowns you must not mind putting your patient to a very great inconvenience. Whenever I do do any crown-work I always employ cocaine, and thereby reduce the pain to a minimum. In fig. 10, taking the shape of the root by means of a piece of wire, I take it that the piece of wire that was passed round to us does not represent the size to be used? If so, I think it is rather too thick. It would be rather difficult to apply a piece of wire that thickness. The method I employ is to use a piece of Stent's composition for taking the impression, then allowing it to cool in the mouth, I take a very thin wafer of warm Stents' and place it in the cold Stents', so get a very accurate impression, which is, a better method than using wire. I think that a large amount of metal used in the crown made by Mr, Woolf might be done away with, besides the amount of metal used would make it so heavy. With regard to the kind of metal. I prefer to use "Coin Gold" (although it does somewhat discolour the porcelain) to pure gold which I at first used.

The President: Some of the specimens are not anything to do with Mr. Woolf, they are to show Dr. Cunningham's plans, and some are lent through the kindness of Mr. Claude Rogers.

Mr. **Farmer** said he would advise the students not to carry the pin to the full length of the root. He had, done a fair amount of crown work, and had been he was sorry to say like a great many more, fond of getting the pin too far into the apex of the root. He advised students not to use corundum discs for cutting the posterior wall of a molar, as they would invariably snap, the diamond disc, he said, would answer much better. He did not agree with using the wire for taking an impression but preferred hard wax. He did not think that saddle-back teeth answered the purpose so well as flat teeth for crowning; as where one put a crown on a root one did so with the hope that it would last the patient for a number of years. It has been his fortune to see several crowns on which these saddle-back bicuspids had been put, and the top of the crown had, by some mishap, snapped completely off. He thought that with a porcelain face and gold or other metal top to bite on, every little difficulty would be surmounted and the teeth would be permanent in the mouth, and did one do anything else one would not be dealing fairly with one's patients. He advised platinum for backing crowns, and he spoke from some considerable experience. He also advised them not to use the "Knapp" blowpipe for soldering crowns (applause.)

Mr. F. H. Weiss thought that no arbitratory rule should be laid down as to the thickness of the gold which should form the collar, if thick gold were used, a corresponding leverage would be required in the root in order to render it safe. He had found no bad result from going through the apex. Altogether, he thought that the increased length of the pin, did give a slight advantage over a shorter one.

Mr. **Rushton** thought that artistic appearance ought to be studied, and in Mr. Woolf's crowns, there was a rather unsightly show of metal. With regard to Knapp's blowpipe, he thought to those who were accustomed to use one, it was the acme of perfection, its results were almost instantaneous. He said it was very necessary to know the proper instruments to use, which show any special advantage over any others.

Mr. Farmer said he should not sacrifice strength for artistic appearance. He, personally, liked the Logan crown, with collar, for appearance. He advised them not to use Knapp's blowpipe at all, unless they were already used to it, for they would be dealing with an instrument which required great manipulation.

Mr. R. Bascombe advised students, especially beginners, to be very careful about drilling up the root, as not so much in those with short straight roots, as with those (often to be met with) where the root was curved or otherwise distorted, the liability to penetrate through into the surrounding tissues, was very great.

Mr. Read said if one did go through the root of a tooth, and dresses it carefully with some antiseptic preparation, it does no harm.

Mr. Perks: By laying a strip of gold on a piece of lead, and striking it upon a zinc die, cutting it down quite level, then putting on your gold ring,and holding it over your Bunsen burner, it soldered without trouble. In fitting a ring, I get a very narrow strip of card, and pass it round the root in order to get the size. I once had a crown brought to me with a request to extract it, the patient had a very nice hole in her cheek, and the dentist had told her it would be all right when he had put the crown on. (Laughter).

Mr. Parris (Leicester Square), mentioned an instrument which answered the double purpose of root-trimmer and amadou holder, which he thought would be very useful in crown work.

The President said,with regard to taking a model of the root for a crown, Stent's composition gives as good an impression as the wax. And as regards saddle-back teeth, Dr. Cunningham proposes to support the tooth by means of porcelain. He makes a porcelain filling under a saddle back tooth, and then fastens it to the ring. It seemed to him, (the President), that there you will receive the support for your tooth in a more positive character than in any other way. He did not think that a Logan crown, or even a saddle back tooth, would compare in strength with a gold crown. He had had bicuspids cut right across the pins.

Mr. Herschell (Leicester Square), thanked Mr. Woolf for his interesting paper, but said that he had brought us so many instruments, that he was afraid they were beyond the reach of most of the students. He knew it as far as he was concerned. He had to content himself with a few corundum wheels and scalers, but very little else. Why, he said, take the trouble of getting a model of the root, when we can fit the cap to the root itself? You can fit the collar in 10 minutes, and the modelling will take you hours altogether. He understood Mr. Woolf to say he had to take a model twice. He said gutta-percha would give a more accurate impression than plaster. He differed from Mr. Woolf, in so far as he preferred using a large quantity of solder on account of the great strain on the pin.

Mr. Woolf replied as follows :—" I am very glad to find that my humble efforts have succeeded in arousing such a spirited debate. It was my intention to put before you to-night, a paper, which would not only prove interesting, but would provide ample scope for argument. I feel, after having listened to the various criticisms put forth, that my expectations have been fully realized. In answer to the various arguments : I prefer using a " Gates Gliddon " drill to clear out the roots as much as possible and then I prefer to fill the apices with osteo.

Mr. Herschell said, " that the instruments introduced, are not within the reach of most Dental Students." I know students' cannot be expected to get all these, but if he does not find out the use of them when in the Hospital, where so many opportunities present themselves from time to time, he is less likely to become acquainted with them when he settles down in his private practice. With regard to the wire being very thick, I did not intend that the specimen shown should be an exact representation of the wire to be used. I still maintain that it is necessary for it to be slightly larger in diameter than the thickness of the band gold, to enable it to be easily removed from the lead in trying it. I prefer to fit to the root as Mr. Herschell suggests. As to taking off the enamel. I don't quite understand the plan of the instrument referred to, whether it is equally used for molars, bicuspids, and front teeth alike. The one I have passed round, is only used for front teeth—for molars, it is out of the question. Howe's trimmer is very useful for getting between two adjacent roots.

Mr. Perks referred to the use of the Bunsen for soldering. The more soldering that can be done with the Bunsen, the better.

Mr. Bascombe suggested not going too far in drilling out the end of the root. You must use your judgment, if you have a doubt as to the length of the root; I don't think there is any harm in passing the instrument up as far as you can, because you always feel when you come to the end. Mr. F. Weiss spoke as to laying down no arbitrary rule as to any particular thickness of gold. I, myself, like No. 4 thickness—which can be used for any kind of crown. Thick gold takes up more room. Then, as to the length of pin to be used with the crown; I hold, the longer the pin, the less strain upon the tooth, if you take one pin away, you remove of course, one of the supports. I disagree with the idea of no trouble being set up by the pin passing through the apex. In fact, I once saw a case in which a person had inserted a wooden peg in the root of a lower 6 year old, of a child aged 8 years. The result was most unsatisfactory, and resulted in the patient having the tooth out at the same sitting, when it was seen that the peg had been forced through the apex.

Answering Mr. Turner, the Logan crown, he suggests, is one of the nicest forms, from an artistic point of view. Regarding thin corundum wheels—they are most useful when you want to divide teeth, it is only by pressure that you break them. The diamond discs—I tried once, the impression was most unfavourable. Referring to backing with platina, one of my specimens is backed with very thin platina, then with gold.

Mr. W. Weiss spoke of selecting his cases for crown-work, with which I quite agree, as I knew of one case, where a patient had been unable to eat on one side of the mouth for nearly three years, owing to the 6 year old being crowned at a time when the wisdom tooth was about to erupt, hence impaction. The 6-year old stump should certainly have been extracted. Mr. Rushton spoke of its being a painful process, it is so in cases, but can be overcome to a great extent by use of cocaine. I have used it on several occasions. I use it for extraction by placing a pellet of wool with a few crystals of cocaine upon it, on either side of the gum for 3 or 4 minutes, and often succeed in getting complete anæsthesia. In conclusion, I would take the opportunity of tendering my thanks for your patient hearing, and to others for the assistance they have afforded me.

Referring to the amount of solder used in this process, I would say there are other methods which can be employed with similar results, and which take less time. I need only refer you to diagrams, which will explain this.

The President announced the next meeting for April 1st., when Mr. Roughton would read a paper on "Lantern Demonstration on Tumours of the Jaws," and he thanked Mr. Woolf for his instructive and complete paper, and said it was one which touched on their every-day work, and he hoped the other papers would partake of the same character

The meeting then adjourned.

Dental News.

THE EDINBURGH DENTAL STUDENTS' SOCIETY ANNUAL DINNER.

The Edinburgh Dental Students dined together on the evening of Friday, March 4th, in the Windsor Hotel, under the auspices of the Dental Students' Society, Mr. Andrew Wilson, L.D.S., lecturer on Dental Anatomy being in the chair and Mr. Frederick Page, L.D.S. acting as croupier. There were over sixty gentlemen present, and altogether the events was one of the most enjoyable of many similar gatherings, held by the students.

After the loyal toasts the chairman proposed the "Edinburgh Dental Students' Society" and in doing so counselled the members to keep personal matters from their debate, and to even aim at the advancement of their profession. The croupier in reply said that one of the principal aims of the society was the advancement of dental science, and they attained that end in many ways. It was the council's endeavour to use such means as to leave no doubt that they had the interests of the juniors at heart. Other toasts were "Kindred Societies," proposed by Mr. H. B. Ezand, L.D.S., replied to by Mr. Amoore, L.D.S., and Mr. Biggs, L.D.S.; "The Edinburgh Dental Hospital" proposed by Dr. F. M. Caird, reply, Mr. Macleod (dean) and Mr. G. W. Watson, L.D.S., "The Edinburgh School of Medicine," proposed by Dr. Guy, replied to by Dr. Symington, and Dr. T. C. Dunlop. "The Guests," and "The Chairman" concluded the official toast list.

A very pleasant evening was spent, one good song being rapidly followed by another, Messrs. David Monroe, L.D.S., Shepherd, L.D.S., Ezand, L.D.S., Turnbull, Logan, Campbell, Cameron, Goldie, Dr. Guy and Mr. Macleod being foremost among dental contributors. The dinner was one of the most pleasant in the annals of the Society, and should do much to encourage the good-fellowship and *esprit de corps* which have always distinguished the members of the society.

LAW REPORT.

Supreme Court of Judicature. Court of Appeal. (Before the Master of the Rolls, Lord Justice Fry, and Lord Justice Lopes.)

Partridge v. General Council of Medical Education and Registration.

This was an application on March 22nd, by the plaintiff, H. F. Partridge, for judgment or for a new trial on appeal from the judgment of Mr. Justice Denman, who entered judgment for the defendants at the trial before him with a special jury, without taking the opinion of the jury. This action was brought for a writ of *mandamus* to compel the General Medical Council to restore the name of the plaintiff to the Dental Register. Under the Dentists Act, 1878 (41 and 42 Vict., c. 33), the Medical Council are directed to keep this register. In 1878 the plaintiff obtained his diploma as a licentiate in dental surgery from the Royal College of Surgeons, Dublin. He was then required to declare that he would not seek to attract business by advertising or by any practice considered by the College to be unbecoming, and he agreed that on this being proved the diploma should be cancelled. In December, 1878, he was duly registered by the defendants under the said Act. In 1882 the plaintiff became totally blind and was unable personally to discharge his duties; he, however, founded an institution called "The South Kensington Ladies' Dental Institution and Association," and advertised his name in connection with such institution. In June, 1886, the General Medical Council decided to erase the plaintiff's name from the dentists' register. Mr. Partridge then applied for a writ of *mandamus* to compel the defendants to restore his name; this was granted by Mr. Justice Mathew and Mr. Justice A. L. Smith on June 15, 1887, and affirmed by the Court of Appeal on August 1 (see 19 Q.B.D., 467). Subsequently the plaintiff brought an action for malicious prosecution, claiming damages, and failed (see 25 Q.B.D., 90). Proceedings were again commenced in October, 1887, to remove the plaintiff's name from the register, and the name was removed on November 25, 1887, and it is in respect of this removal that the present action was brought. By section 13 of the Dentists Act, 1878, it is provided—"The General Council may and upon the application of any of the medical authorities shall cause inquiry to be made into the case of a person alleged to be liable to have his name erased under this section, and on proof of such conviction or of such infamous or disgraceful conduct shall cause the name of such person to be erased from the register." One of the causes referred to therein is "being guilty of any infamous or disgraceful conduct in a professional respect." Under section 15 the appointment of a permanent committee to ascertain the facts of any case is provided for.

Mr. Willis, Q.C., and Mr. A. Beddall appeared for the appellant and submitted that there was evidence to go to the jury to show that the Council had not properly exercised their powers under the Act. The Council had only power to remove the name, "on proof" of the disgraceful conduct in a professional respect. They have no discretion until evidence has been given, which in the opinion of the Court, is evidence from which they can reasonably come to such a conclusion. Here there was no such evidence. [Lord Justice Lopes referred to the case of "Allbutt v. General Medical Council" (23 Q.B.D., 400).] That was under a different Act—21 and 22 Vict., chap. 90, section 29—and the words are essentially different. The Court is now to inquire if the influence is properly drawn, but there must be some reasonable evidence upon which they could act. Powers of this sort must be watched, otherwise, disabilities would be created. [Lord Justice Lopes.—Would it not be disgraceful conduct for a barrister to advertise?] We often see notices in the paper that a barrister has joined a particular circuit, and conducts very like advertising. The charge is not that he advertises in England; many dentists on the register do this. [The Master of the Rolls.—I hope this is not so. I should desire to see the dental profession in the same high position as other medical men.] Another point is that there was one person—namely, Mr. Macnamara—who was in the position both of accuser and judge. Mr. Macnamara was the representative of the Royal College of Surgeons, Dublin, on the Medical Council in England, and he acted both in setting the College in motion and in adjudicating on the charge when made. Again, Mr. Partridge was not heard or summoned to be present at the Council. From the above facts, an inference of malice may fairly be drawn. The following cases were also cited :—"Leeson v. General Medical Council," 43 Ch. Div., 366 ; "Reg. v. Allen," 4 B. and S., 915 ; "Reg. v. Milledge," 4 Q.B.D. 332.

Mr. R. T. Reid, Q.C., and Mr. Muir Mackenzie, for the respondents, were not called upon.

The Court dismissed the appeal.

The Master of the Rolls, in giving judgment, said,—In this case a person, whom I shall call a professional man, has been summoned to appear before a body of which he has become a member. An Act of Parliament has authorized him to be put upon a certain register, and thereby he obtains certain position and benefits. This Act says that if this body who are a domestic forum, should find him guilty of any infamous or disgraceful conduct in a professional respect they have a right to strike him off the register. They have done this here. Some time ago the plaintiff brought an action against this body for maliciously striking off his name, and he failed. Now he brings an action partly for a *mandamus* and partly for damages. The greater part of the argument has been directed to the first part of that claim. There is really no evidence on which any one can say these gentlemen were actuated by anything like malice. As to the action for a *mandamus*, all we have to see is whether the body against whom the *mandamus* is asked had jurisdiction to do what they have done. It has been alleged there was no evidence before them which would give them jurisdiction. The Council were acting under section 13 of the Dentists Act, 1878. The plaintiff had, on obtaining his diploma in Ireland, promised not to advertise while holding that diploma. That body considered that they should act fairly by each other, and ought not to advertise. Just as in our profession, where all are rivals against each other, a barrister is not allowed to advertise his superior talents or that he will do his advocacy cheaper. I think if he did so I should consider it such disgraceful conduct that he ought to be immediately disbarred. No one need become a member of the dental profession unless he desires it. I say the authorities—this domestic tribunal have a right to determine if it is within reason whether the conduct is or is not disgraceful professional conduct. In Ireland the defendant had promised not to advertise, and, having given that promise, according to his own evidence, he had spent more than £10,000 in advertising. This is his admission, and he continued to advertise after he had received a warning from the college in Dublin. This must be evidence of disgraceful conduct in a professional respect, and ample evidence upon which the Council might exercise jurisdiction. A *mandamus* cannot therefore go to them; they are not a Court and no rules are binding on them; under section 15 a committee is appointed. Fault cannot be found with them, unless you can show that what they have done is contrary to natural justice. I agree it is contrary to natural justice to impose a penalty without letting a man know the accusation and without giving him an opportunity to meet it. It is said the Council did not give the plaintiff notice; but this is frivolous in this case, for a letter was written to the plaintiff telling him that his case would be considered on a particular day, and asking him to send any written defence he might desire or to attend in person, or both. He declines to attend, and we are told his reason was that there was no dispute as to the facts. Another point has been taken. It is said there was one person who was accuser and judge; it is against natural justice that an accuser should be also the judge. He must be both accuser and judge, and it has been argued that Mr. Macnamara was both these in the present case. When you look at the facts no one can truly say he was the accuser. The rule of law is well laid down in "Leeson v. General Medical Council" (43 Ch. D., at p. 384), as follows:—"It must be in all cases a question of substance and of fact whether one of the judges has in truth also been an accuser." That is to distinguish it from mere technicalities. There is no evidence here that in fact Mr. Macnamara authorized or directed that this accusation should be brought. He received a letter from the secretary to the Council in England, and the inference is he handed it to the persons who acted upon it. As to being a judge, it is not shown that he was present at the Council at the time the report of the committee was dealt with. Something was also said about his being interested. Even if he had acted in Ireland when the College decided to withdraw the diploma, and also in England, even on the same evidence this would not show that he was interested. As Mr. Justice Denman has pointed out, the Judge who tried a case might also sit and hear the case in the Exchequer Chamber, and afterwards, perhaps, also in the House of Lords. On no one possible ground, can the objections taken be maintained. This Court cannot interfere, even if they thought the Council had come to the wrong conclusion. I cannot part with this case without saying that, so far from doubting as to whether they were right or wrong, I am perfectly certain they were right. The appeal must be dismissed with costs.

Lord Justice Fry.—One of the duties of the Medical Council is to keep the register required by the Dentists' Act, 1878, and by that Act, it is provided that, on the application of any of the medical authorities, the Council shall make enquiries into the case of any one liable to have his name erased. The Royal College of Surgeons in Ireland, is one of those medical authorities. The plaintiff here, notwithstanding his promise to the college which granted him his diploma, habitually advertised, and continued to do so after being warned by that college. This was, in my opinion, disgraceful conduct in a professional respect. This was the accusation made against him, and the facts are not in dispute; and yet the plaintiff comes to us to say there was not a tittle of evidence that he was guilty of disgraceful conduct. I say nothing as to whether mere advertising is disgraceful conduct, as the point is not before us ; but my silence must not be considered as saying that it is not. There is one point to which I must advert- Mr. Willis made a statement with regard to the Bar, which I was surprised and grieved to hear. If what he suggested is true, I think it is high time that such things should be brought to the notice of the Inns of Court. As regards Mr. Macnamara I will only point out that the law is distinctly laid down by the majority of the Court in "Leeson v. General Medical Council." I do not think there is any evidence here that Mr. Macnamara was in any sense the accuser. I agree that this appeal must be dismissed.

Lord Justice Lopes.—But for the fact of this being an important case, I should not add a word. In this case the facts are all admitted. The plaintiff undertook not to attract business by advertising, or any other conduct which would be considered unbecoming by his college. It is admitted that in violation of this he has largely and extensively advertised, and this after repeated warnings. A *mandamus* can only go if there was no evidence upon which the Council could reasonably act. If there were evidence, the decision of the Council is final and conclusive. They are the sole judges. The plaintiff violated his solemn undertaking, and I am of opinion that this was clear evidence upon which the Council ought to find him guilty of disgraceful conduct in a professional respect. As to whether mere advertising would be such conduct, I do not dissent from the expression of opinion given by the Master of the Rolls. I must also add that I have heard with great pain, certain words uttered by Mr. Willis, as to the conduct of some members of the Bar. I can only believe that he is mistaken. I feel sure, that any one guilty of such conduct would, if he were brought before the Benchers, meet with such punishment as he would rightly deserve. I think here, that the plaintiff had ample notice that his case would be considered, and I do not think that there is any evidence that Mr. Macnamara acted both as accuser and judge.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

CHILDREN'S TEETH.

To the Editor of the "British Journal of Dental Science."

Sir,—In your last issue I note a paragraph on children's teeth, in which reference is made to my having written a letter advocating the appointment of a Dental Surgeon to the Central London District School, &c. If the writer had been acquainted with the facts as to how my letter came before the Board, I do not think he would have laid stress upon the undesirability of my doing so in my private capacity as a member of the Profession.

Briefly the facts are as follows:—In May, of 1891, I received permission from the Board to examine the mouths of the children at the Central London District School, Hanwell, with the condition that I should send in a Report as to the results. This I have carefully done with the able assistance of my friend and colleague, Mr. Sidney Spokes, 903 children were examined and the results carefully tabulated. On completion of the examination—which I may mention was commenced in August, and finished at the end of December—I received an intimation from the Clerk of the Board, *that the Managers would be glad to hear a few suggestions as to any remedy* I might care to suggest for any conditions found at the conclusion of the examination. The report was sent in accordingly. It was accompanied by a private letter to the Clerk with a few suggestions, which Mr. Spokes and I considered were better omitted from the report.

That a Member of the Board should think my letter an extraordinary one need not surprise anyone. The condition of things revealed in the Report was enough to astonish dentists, as well as laymen.

I am, Sir,
Your obedient servant,
RICHARD DENISON PEDLEY.

March 13, 1892.

To the Editor of the "British Journal of Dental Science."

SIR,—In your issue of 15th February, you have a paragraph in which you state that the step contemplated by the Edinburgh Dental Hospital and School, of registering itself under the Companies Acts, will take it out of the category of Benevolent Institutions and render it a trade concern. This, however, will not be the case, as special care has been taken to provide that no dividend or profit of any kind shall be paid to any one who is, or has been a member of the Association. The Memorandum and Articles of Association are at present under the consideration of the Board of Trade, and when these have been sanctioned, I will have pleasure in forwarding you a copy for publication and comment.

Yours truly,
W. BOWMAN MACLEOD.
Dean, E.D.H. & S.

APPOINTMENTS.

Mr. H. Lloyd Williams, M.R.C.S., L.D.S., to be Assistant Dental Surgeon to the London Dental Hospital.

Mr. Cornelius Robbins, L.D.S., to be Assistant Dental Surgeon to the London Dental Hospital.

Mr. George Hern, L.R.C.P., M.R.C.S., L.D.S., to be Demonstrator in the London School of Dental Surgery.

British Journal of Dental Science.

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ANTERIOR PROTRUSION.*

By David Hepburn, L.D.S. Eng.

Mr. President and Gentlemen,—When our worthy Secretary, Mr. Maggs, called upon me a short time ago and explained that it was the desire of the President that at this meeting of our Society a discussion should take place in connection with irregularities of the teeth, I concurred fully in the desirability of such a proceeding, feeling assured that the accumulated experiences of members necessarily called forth by a discussion on a theme of such importance would be a means of adding materially to our knowledge. The subject, however, seemed a large one, too extensive for the limits of one short meeting, and I was gratified when I learned that the intention was to limit the discussion to one distinctive form of irregularity, namely, that of "Anterior Protrusion," and in connection only with the upper jaw. The special type of deformity selected seemed to me to be wisely determined upon, for no condition of abnormally placed teeth presents more points of interest, it being obscure as to its etiology, markedly disfiguring to the patient, in pronounced cases eminently difficult to remedy, and frequently uncertain as to the ultimate results of treatment.

When our President did me the honour of inviting me to open this discussion, I willingly assented, especially as I was assured that a few remarks would suffice for the purpose. It is not, therefore, my intention to dogmatize or endeavour to unfold to you the whole subject, but merely to place before you a few points gained from my own experience and observation, which may be useful in a measure by serving as keys for unlocking the gates of that knowledge which I feel sure exists in this Society.

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* A paper read before the Odontological Society of Great Britain.

From my collection I have selected a limited number of models which I shall presently describe to you. In one of the cases the patient has been under observation for seven years, and in another I have had frequent opportunities of noting the various changes in the mouth during a period of twelve years. The selection of these two cases has been made with a view to the practical illustration of two points which I consider of great importance, namely, the occasional uncertainty of treatment, and again the marked tendency which nature has, in certain cases, to modify abnormal conditions of protrusion, which in the child are evidenced in unsightly disfigurement, until in the adult an almost normal state results, or more strictly speaking, one which is little offensive to the eye.

Now, in speaking of anterior protrusion in connection with the upper jaw, I wish to direct my remarks as far as possible to those cases where the deformity exists as a distinctive condition due to abnormal deposit of bone in the pre-maxillary region, its origin being unattributable to mechanical influences such as thumb-sucking or the impingement of antagonizing teeth. Doubtless, both these agencies may materially assist in exaggerating protrusion where the tendency exists for its development, but, unquestionably, there is a distinct class of case which has its origin in some inherent propensity in the individual to excessive development of osseous tissue, cases in which the lower incisors never have, and never can, come in contact with the posterior surfaces of their natural opponents in the upper jaw, and where even indirect force, applied through the mucous membrane and alveolus cannot be credited with aiding towards the deformity, because the cutting edges of the lower incisors exist as it were in space, pointing upwards towards the palatal vault, and free from contact with any of the superexisting structures. The appearances characteristic of the deformity are too well known to need mention; indeed, I fear the child with the obtrusive incisors overlapping its lower lip is now-a-days a too common object in the consulting room of the dental practitioner.

As to the etiology of this condition I think we have yet much to learn. The difficulty of obtaining even dry specimens is so great that the possibilities of research in this direction are limited, but the question of heredity is one which may with advantage be discussed.

It is, I believe, sometimes stated that the condition is not due to the influence of parental transmission, but in my own experience I have found it frequently attributable to this cause ; indeed, in most of those cases, the models of which I happen to have brought with me this evening, I have been able in the parents to recognize conditions which would be likely to descend in the form of superior protrusion in the offspring.

Curiously enough, no marked peculiarity distinguishes the temporary dentition, but in my own mind I am apt to associate a somewhat narrow and abnormally deep temporary alveolus with the probability of "protrusion" when the permanent teeth are erupted. It would appear that excessive proliferation of bone cells at about the period of the eruption of the anterior permanent teeth in the upper jaw at first imparts to them an oblique direction which becomes more marked as eruption progresses. This once established, continued and excessive growth of the alveolus takes place, which may go on to greater or less degree. The teeth are carried with it, sometimes only to the extent that the lower incisors impinge at the necks of the superior teeth, but again so great may be the abnormal growth that frequently the superior incisors, with their concomitant alveolus, protrude offensively an inch or so in advance of the normal arch. In any case a more or less imbecile expression of countenance is imparted by the deformity, although the child may be mentally and physically well developed in all other respects.

The teeth may frequently have more than sufficient room, and apart from their undue prominence may be erupted in a regular arch. On the other hand, they are frequently crowded and irregular, but I look upon this as, so to speak, an accidental condition due, may be, to extreme size of the organs, or irregularities in the position of their crypts previous to eruption. This condition of "irregularity" complicates treatment in a marked degree.

I have spoken of this distinctive protrusion as being associated with the intermaxillary region, and I believe it to be so, for in a large number of typical cases the canines are erupted in normal antagonism with their opponents. When such is not the case their forward position, as far as I have been able to observe, is due to this accidental irregularity, sometimes associated with the excessive bone development I have just referred to.

Now, under certain conditions, namely, where there is no inimical impingement of the lower incisors or loss of teeth from decay, or other causes, in the masticating region, I believe there is a marked tendency on the part of nature to modify this deformity as time goes on. With the complete eruption of the incisors, provided there be no undue pressure from the advancing bicuspids and molars, I incline strongly to the opinion that the deformity has reached its greatest development, and that if the teeth have but room they will improve in position rather than grow worse. The natural increase in length of the bicuspids and molars is a most important means of bringing about conditions favourable for improvement, so also the muscular action of the upper lip, especially if attention be directed to it. But in addition to all this the facial bones and superjacent muscles and integuments increase to dwarf, as it were, the deformity, and to such an extent, that with the other agencies alluded to at work, frequently an unsightly child may, without mechanical or surgical interference, develop into a presentable adult.

These conditions, showing that after a certain period natural agencies are with us, indicate clearly the beneficial results which may be expected from judicious treatment such as the raising or alteration of the bite, the removal of harmful antagonism of teeth, the extraction of teeth to create space, and when favourable conditions are established the application, by mechanical means, of pressure to the prominent organs. Further, the recognition of the physiological changes which the alveolus may undergo, and the probable alterations which time may effect in the relations of the teeth to one another must serve to aid us in deciding when it is advisable merely to wait and watch.

Lastly, the density of the osseous tissues, the position of the apices of the roots of the offending teeth, and firmly established conditions of inheritance, conditions which in the parents have not yielded either to natural forces or surgical or mechanical interference, will assist us in forming a prognosis as to what extent treatment, if adopted, may be successful in its ultimate results.

And, now, Mr. President and gentlemen, in order to bring my remarks to a practical issue, I will with your permission describe the models I have brought with me.

SOME POINTS IN CONTOUR FILLING.

By F. W. Minshall, L.D.S.

Mr. President and Gentlemen,—In introducing for discussion to-night "Some Points in Contour Filling," I would direct your attention at the outset to the first three words of the title I have chosen, which, through a slight misunderstanding on the part of one of our Hon. Secretaries, were omitted from the syllabus supplied at the commencement of the session. I desire to do this especially because my hopes will be quite fulfilled if I am able to start a discussion upon the subject, in some of its bearings upon our every-day work, among those members of this Society who are so much better able to deal with it profitably than I am; and also because my self-esteem, even in its loftiest flights, never soared quite so high as to persuade me that I was competent to write a succinct, complete and accurate scientific monograph upon such an important topic as "Contour Fillings."

The first limitation arises from the fact that my remarks will apply chiefly to contour fillings inserted in the molars and bicuspids. The debateable questions of "Contour v. Wide Separation," and the wisdom or error of an intermediate stage between the two, are scarcely within the lines intended for this paper, and I will content myself with saying that I consider contour always preferable to flat-face fillings in all teeth posterior to the canines, provided we have any means at our command of conserving sufficient healthy tooth tissue of suitable form, or of inserting retaining screws or posts—without reliance upon small retaining pits—in such a manner as to give us reasonable hope of the fillings withstanding the force brought to bear upon them in mastication.

The retention of fillings by the *adhesion* of the various plastic cements, as recently recommended by various writers and speakers, I omit, owing to want of sufficient experience to enable me to pronounce an opinion, but this might be of some help, providing we are careful not to place our chief reliance upon it.

Flat-face fillings with wide separation should, I think, be reserved for very frail teeth of poor quality, and for badly broken-down teeth, which for some reason it is not considered advisable to "crown" immediately. The advice given at a recent meeting of the Odontological Society of Great Britain by Mr. L. Matheson,—"When in doubt, play contour,"—is excellent, so far as it goes, but I would venture to go a little further, and say, "When *possible* play contour." In my opinion the only ordinary cases in which "Contour" is not preferable to "Flat-face" in the teeth under consideration are those :—

(*a*) In which a full restoration to normal size and shape would result in the probable early loss of the filling, and the whole or part of the remaining portion of the crown; or those.

(*b*) In which the approximate tooth has already been lost, when the time spent in fully contouring would be to some extent wasted.

There is, in addition, a special class of cases, or rather patients, to which attention has recently been drawn in a French nautical Journal—"Le Yacht"—an article in which, as quoted by the *Birmingham Weekly Post*, of October 3, 1891, would seem to suggest special care on our part in any fillings—contour or other—inserted in the mouths of those of our patients whose duty or pleasure may lead them to take cruises in torpedo boats, for the writer of that article (M. Normand) says :

"Some ot the earlier torpedo-boats are said to have vibrated so much as to loosen the stopping in the teeth of an Inspecting Officer, and quite a number of our recent war vessels of the torpedo cruiser class have not been worked at their intended speed on account, it is said, of the excessive vibration."

Well, gentlemen, I am sure no member of our Society, other than myself, ever inserts fillings of any kind which could be loosened by any moderate amount of torpedo-boat vibration, and as to the best of my knowledge and belief I never had an Inspector of torpedo-boats in my chair, I trust your verdict in this case as to myself will at least be the Scotch one of "Not prōven."

One of the few points I wish to bring before you will be best illustrated by a short account of an incident in practice. Some two years ago a young gentleman, with a remarkably clean dental bill of health, called to consult me about a second left upper molar which he said interfered considerably with his enjoyment of Salford beef-steaks. I found a moderate sized anterior approximal cavity extending slightly into the crown, and at once proceeded to excavate it. There was no exposure of the pulp, no undue sensibility of the dentine , it was soon reduced to an almost typical shape, and at once filled with amalgam, restoring the contour without matrix or any separation, and the following day the filling was trimmed and polished. About a month after he returned and asked me to extract the tooth, as he still could not eat beef-steaks, although in other respects the tooth gave no trouble.

An examination revealed the presence of a few meat fibres between the molars, and slight roughness of the cervical margin. The molars were then slightly separated with Perry's separator, the filling again polished carefully and the patient sent away with instructions to keep the space between the teeth carefully cleansed from all particles of food.

He again returned in a few weeks with a similar complaint and request, and this time the filling was removed and a temporary filling of gutta-percha, inserted with the idea of gaining rather more separation, as the teeth could only be slightly moved with the steel separator. After a few weeks he returned as arranged, this time perfectly comfortable, and quite the master of a Salford steak, and proposed, if I was agreeable, to allow the gutta-percha to remain. However, as the desired space had been obtained, the temporary filling was removed, a thin matrix placed loosely round the tooth (but wedged closely to the cervical margin) and amalgam reinserted, the cervical margin trimmed as carefully as possible after removing the matrix, but in other respects the filling left rather too prominent on the approximal surface until the following day, when the separator was again applied and the filling trimmed and polished, and three weeks after the tooth had approached its neighbour so closely that it required some force to pass silk between, and "the beef-steaks had ceased from troubling, and his molars were at work."

I trust to the generosity of the meeting to excuse my prolixity in stating this case of failure, followed by ultimate success, but it has been done to emphasize my belief in the necessity of at least sufficiently *wide separation for full contour*. As the methods of obtaining the requisite space, I prefer immediate separation where possible for gold contour, using the original form of Perry's separator for the purpose ; and gradual separation for amalgam, especially in those cases where the filling will come into apposition with the enamel of the adjoining tooth, because if the teeth resume their normal situations before the amalgam has had time to harden, if the pressure of the approaching teeth is not sufficient to crush the filling, it will still probably cause a slight concave depression on the surface of it which cannot be as satisfactory in a conservative sense as a convex surface.

Where two teeth are to be contoured approximately with amalgam, immediate separation may be resorted to, because the form of the surface of contact in these cases is less important than absolute contact ; and isolation of the two masses of amalgam during setting may be secured by placing between the fillings a smooth piece of platinum foil or gutta-percha tissue, to be removed the following day when the fillings are finally polished.

With regard to the gradual separation of firmly implanted molars and bicuspids, I have found the insertion of temporary fillings of gutta-percha—filling the cavity nearly to the top with a low grade, and capping this with a layer of hard—more satisfactory and of less annoyance to the patient than wood or rubber wedges, tape, etc.

Another point in contouring which seems worthy of more care and attention than it often receives is the restoration of the natural form of the coronal grinding surface, and this I have been induced to pay more attention to as the result of a little personal experience. I have a first right upper bicuspid carrying a very beautiful gold contour filling which at the time of its insertion very nicely approximated to a smaller gold filling in the canine, but which, for the want of a little more care in forming the crown surface, was not quite so comfortable a few months after as at the time of its insertion, as it allowed portions of food to be forced between the teeth which was not the case originally. On examination I found the occluding lower tooth was articulating upon an inclined plane of gold, and was thus gradually, but surely, driving the bicuspid backwards and away from the canine. The remova of a small portion of gold with a finishing bur arrested its progress, but the tooth never again made contact with its fellow.

In building up contour fillings, it is but little more trouble to insert sufficient gold or amalgam to allow us afterwards to carefully carve and grind up something nearly approaching the natural form of cusps, grooves, oblique ridges, and, especially, approximal ridges, and time so spent in building and carving will be well repaid in the feeling of comfort and "naturalness" which a tooth so treated will have to the patient's tongue, instead of leaving that flat, concave, or convex smooth and equable surface which suggests to many patients the presence of "something in the tooth."

In forming the approximal ridges, I think it wise to exaggerate rather than to reduce the size, because of the important part they play in preventing the forcing of food between the teeth, and in restoring the contour of molars much worn by attrition, it is advisable to leave the filling at this point at as sharp an angle as the material used will permit.

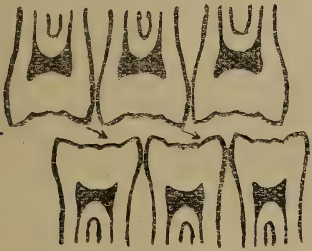

Fig. 1.

Fig. 1 is intended to show the lines of force the food would receive during mastication, so far as they would affect approximal fillings. The small arrows indicate the direction the food would tend to take when the lower jaw is pushed forward on that side.

Fig. 2 shows the result likely to occur when the filling is not sufficiently contoured on the approximal surface, and the approximal ridge has not been restored. In this case, the protrusion of the lower jaw in mastication would be likely to wedge masses of food tightly into the space marked X. Where the posterior lingual and buccal cusps remain or have been restored to nearly original size the mischief is intensified.

The Figures are slightly inaccurate in assuming that the central line of upper and lower molars to be exactly in the same plane.

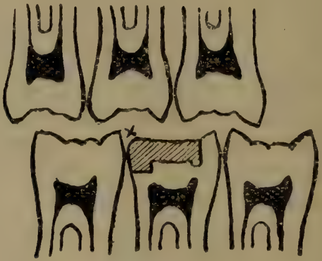

Fig. 2.

Where we have sufficient confidence in the anchorage of an approximal contour filling, it appears to me to be imperatively demanded that the masticating surface of the filling shall be so shaped that the force brought to bear upon it in mastication shall tend at least to drive the filling towards the adjoining tooth quite as much, if not more, than in the opposite direction. This would admittedly tend to dislodge an imperfectly anchored filling, but in the majority of cases sufficient "tie" can be obtained either by a dovetail slot in the crown, and careful preparation of the cavity, or by retaining posts, or by a combination of all.

For retaining posts in amalgam fillings either the small steel watch screws suggested at a former meeting by Mr. Simms, or hard platinum wire which has been slightly tinned and well barbed, and which is first fixed in the cavity prepared for it with copper amalgam, give good results. In gold fillings, if retaining posts are used, gold screws are, at any rate æsthetically, best, but are seldom wanted, as the amount of time necessary, and the strain upon both patient and operator, involved in the insertion of a gold filling, so large as to need them, renders the operation in these "crowning" days a somewhat questionable one.

There is one point in filling distal cavities of large size with gold, especially in molars, which I have recently adopted with, I think, advantage, and which although probably not new, I do not remember to have seen advocated. It is where we have good lingual and buccal walls when the cavity is prepared, to build up the distal wall of the filling *before* filling the general crown cavity. This offers several advantages in the view of the work, and increased facility in the use of foot pluggers, but it also presents the disadvantage of increasing the possibilities of forcing the gold out of the cavity instead of filling it, but up to the present I have never experienced this misfortune when I have adopted the method. Another advantage of this method is that the remaining cavity may then be readily filled as a simple crown cavity with non-cohesive foil or cylinders, or the deeper portion may be filled with gold and tin or oxy-chloride, or oxy-phosphate, etc., and finished with cohesive foil. In those cases in which a dovetail slot has been deemed necessary, it is advisable to stop short in the building of the distal wall, just before the full height has been attained, and then to finish the whole crown surface, including the "coping-stone" of the wall, with cohesive foil which thus becomes converted into a very satisfactory "cross-tie," to support the whole edifice.

As to the manner of procedure in building up a distal wall in this way, a few words may perhaps not be altogether out of place. If it is decided to build entirely cohesively—and this is often the easier method—I have found the simplest plan to be to cut a rather large retaining pit, not a mere point, well within the internal angle of the lingual and buccal walls respectively, and to form at least that part of the filling which abuts upon those walls with short lengths cut from loosely twisted rope of No. 4 foil, annealed immediately before use, keeping the margins of the filling well in advance of the centre, and condensing from the centre outwards each way. Cylinders placed horizontally may be used for the central portion of the wall, but I look upon foil as more reliable in most cases.

In those instances where the retaining walls are well supported by dentine, and the lines of the inner faces of which, if produced distally would meet, tin and gold may be used for the beginning of the filling, or loosely twisted rope of non-cohesive foil may be used for the margins and heavy cylinders of soft gold wedged between, and thus form the foundation and base, using cohesive foil as soon as much building out for contour is required, in this way saving much time.

In conclusion, gentlemen, I would say I have striven to bring before you a few points on this subject which seem to me of some importance, with a brief account of the means whereby I have endeavoured to attain certain results; and now I rely upon the discussion, which I hope will be as full and free as it is certain to be fair, to show me "a more excellent way," and I shall resume my seat with just a scintilla of hope and trust that you will one and all

> "Be to my faults a little blind,
> And to my virtues *very* kind."

THE USE OF COCAINE IN SURGERY.

At a recent meeting of the Islington Medical Society, Dr. Woodroffe read a paper upon this subject, and gave a list of more than a dozen minor operations in which he had used the salt. He wondered how general practitioners got on formerly without it. He never injects more than half a grain, and waits two or three minutes before repeating the injection in cases where a large dose is required. He had never seen any symptom supervene which did not show itself on administering the first dose. Two cases where there was a poisonous effect both occurred in females, and he thinks such a result depends far more upon idiosyncrasy than on the quantity of the drug used. The symptoms appear immediately after injection; the most evident were pallor of the face, dilatation of the pupils, sense of impending death, with great restlessness, orthopnœa and very rapid cardiac action. These symptoms were followed by perspirations, and in the case of a girl, by rambling, incoherent talk for some hours. The treatment adopted was the inhalation of ether and ammonia, with repeated doses of hot brandy and-water.

Lancet.

Female Dentists in Sweden.—In Stockholm a scholarship has been instituted expressly for female students who intend to study dentistry. It has just been awarded to Miss Elena Levin, who recently qualified at the Gothenburg School of Dentistry.

British Journal of Dental Science.

LONDON, APRIL 15th, 1892.

PAIN IN PATIENTS.

If a dentist be asked whether male or female patients suffer the most pain, it is not easy to give an absolute reply. We imagine that a somewhat vague impression exists that men are more irritable during operations, and more intolerant of the deliberation which necessarily accompanies skilled work; whilst women are not so impatient, but are more marked for their resignation or determination. And it is easier to make a generalised statement, such as this, than to say that either class really suffers more pain than the other. At all events one is scarcely prepared, at first sight, to say that women are absolutely less sensitive to physical sensation, and that they are not so susceptible to pain as are men, and yet this is what Professor Lombroso would have us believe. In an article in the *Fortnightly Review* he states that no real data exist upon which we can judge of the physical and moral condition of the female constitution, and that upon the subject of feminine sensibility in general, physiological authorities content themselves with reiterating "the common conjecture that women are much more sensitive than men; an opinion which up to the present is not confirmed by scientific research." The Professor used Weber's æsthesiometer, and found that women's sense of touch is, in general, nearly twice as obtuse as that of men and he gives the exact figures expressed in millimeters.

With regard to general sensibility, including sensitiveness to pain, he made experiments upon fifty women of the lower class, by means of the electric algometer, and by comparison with others obtained results which show that woman is much "inferior" to man, whilst the very young men appear to be most responsive.

Without staying to consider whether this characteristic of inferiority is to be regarded as a detriment, in a physiological sense, one is tempted to commence a criticism of the results of the experiments by a reference to the material made use of. It would be much more satisfactory to know something of the physique of the men who were employed to form some sort of standard of comparison. The climate, food, mode of life and general environment, obtaining amongst this class of men in the Southern part of Europe, must all be taken into account, and the criticisms of travellers with regard to the physical capabilities and energy displayed by the two sexes is not always in favour of the one usually called "the stronger." Indeed it is not difficult to understand that, if the men tested were taken from an effeminate, lazy class, who prefer to exist at the expense of the woman's subjection, the results would come out much as in the above table. The Professor alludes to this subjection, but more with an idea of showing why the women are "inferior."

Amongst the surgical opinions with which he fortifies his argument, are the statements of two dentists. Dr. Martini, of Turin, has been surprised to find that women undergo every variety of dental operation with much more courage and facility than men. Dr. Mela states that men swoon much more frequently than women, under the dentist's hands. Although we are ready to accept Professor Lombroso's scientific statements tentatively, that is until they have been corroborated or refuted, yet to our mind the question of personal equation would seem to lend some weight to a suggestion that the courage and facility, mentioned by Dr. Martini, must be taken into account another way. At least it is more pleasant to join in the popular belief that a woman is able to bear the same amount of pain with greater courage and forbearance than the man.

If this physical insensibility of women be a fact, we suppose it must have been brought about by some natural law working on the lines of the survival of the fittest. All will admit that the female comes into the world with a greater possibility of being subjected to pain, and if in the course of succeeding generations, those of them have been gradually "selected" who do not succumb to its effects, we can understand how it is that they *should* be more insensible; those who were *too* sensitive having died out, unable to adapt themselves to the painful environment. On the other hand this argument would also seem to hold good if we claim that the woman does feel the pain, but (by a similar process to that alluded to above), has become endowed with a moral courage, and such power of endurance, as will enable her to support an amount of physical anguish which man finds it impossible to do, without a display of emotional discharge.

If the Professor's theory be true, no dentist will regret it, but at present it would be unwise to attempt to increase the ordinary demand upon the feminine organism either by more painful or more prolonged operations.

THE SALIVA AS A MICROBE KILLER.—During a discussion which recently took place, reference was made to the entrance of saliva into the antrum when this cavity has been opened from the mouth. The speaker was of opinion that the mucous membrane is always infected if the saliva passes in, and he alluded to experiments where saliva is injected into rabbits ; it acts as a poison and generally kills them. This position was not allowed to remain unchallenged, and other speakers pointed ont that ulcers of the mouth heal in the presence of saliva, and that dogs lick their sores until they get well. We know that although there are many micro-organisms present in the mouth, and that fractures of the jaw are almost always compound, yet the healing process generally goes on satisfactorily, Sanarelli (centrabl f. Bakt. u. Paras, January 9th, 1892), alluding to the remarkable fact that primary lesions appear so rarely in the mouth, says this has been attributed to the chemical properties of the saliva, to the resistance and regenerative power of the tissues of the mouth, and to the conflict between pathogenic bacteria and saprophytes. The author investigated the properties of the saliva in respect to the growth of the micro-organisms most often found in the mouth. The saliva is shown to possess bacteria-killing properties not unlimited in degree, but dependent on certain conditions and chiefly on the number of micro-organisms introduced into it, and the *British Medical* epitome gives some of the results obtained. It is not yet clear to what substance the saliva owes its bacteria-killing properties. The author sums up that the saliva is an unfavourable cultivation medium for certain pathogenic micro-organisms, destroying them (when not too abundant) more or less rapidly, and that it so alters the type in others as to render them powerless. We suppose that the micro-organisms principally concerned in the production of caries are not included in the list.

THE STATUS OF DENTISTRY IN VICTORIA.—A paper read before the Dental Association of Victoria, by Mr. Horace Stevens shows that before the registration of dentists under the Dentists' Act, 1887, there were, according to the Post Office Directory, 103 persons designated dentists in Victoria; there are 520 names on the register of 1890. In the first Dental Register, 1888, there were 494 names of those who were legally entitled to practise dentistry. This vast increase was due to the clause in the Act giving anyone the right to claim registration who would make the declaration that he or she was *bona fide* practising before the passing of the Act. With regard to the future, it appears to the author that if students only come forward at the present rate, three in two years, in forty years hence, there will only be some sixty (who have learned their profession there) on the Register. Much the same kind of abuse, from placing mysterious letters after the name, seems to be rampant in Victoria as in England. It is on record that the letters M.D., which the public understand to signify that the user thereof has studied for, and obtained a diploma as a physician or doctor of medicine were appropriated by an impudent fellow, who when asked what he meant by using them, said M.D. stood for mechanical dentist, which he in truth was, and a bad one.

THE DENTISTS' REGISTER FOR 1892.—This Register is printed for the General Medical Council, by Her Majesty's Stationery Office, and has just been issued. It shows that there are 79 additional names over that of last year, making a total of 4,896, a much less number than appeared in the earlier registers after the passing of the Act. It will be remembered that during the past year the admissions under clause 37 were brought to a close, so that none can register now unless in possession of a diploma. We are unable to say what proportion of the 79 new entries came in under clause 37, but 1,179 of those on the new register, or a little over 24 per cent, possess the qualification of Licentiate in Dental Surgery. A few years back this percentage was much lower, and in the natural course of events it must now steadily rise year after year. Foreign Dentists now number 19, and a reference to last year's Register shows this this to be an increase of 4.

A UNIVERSITY DEGREE FOR PHARMACISTS.—The *Chemist and Druggist* has an article urging students to consider the advisability of taking the B.Sc.Lond., and pointing out how it may be done. All the ground has been covered by men who have only had the evenings to work in, and if the honours papers are not attempted, there seems every reason to think that the ordinary intelligent pharmacist can gain this scientific degree. With regard to the cost it is stated that the whole of the educational expense can be covered by about £50, whilst the fees for the examinations are £12. It seems that " The Birkbeck" Institution passed 104 men at London last year, whilst King's and University Colleges passed 36 between them.

Not many Dental Students will admit that they have any time to spare, but for those who will have already taken up such subjects as Chemistry, and, under the new regulations, Biology, there may come a time at the completion of their Hospital life, when sufficient study could be given to the additional subjects for the B. Sc., a degree which has always been regarded as worth having.

DENTAL EXAMINATIONS IN TASMANIA.—We have had an opportunity of reading the account of the meeting of the Dental Board of Examiners in Launceston, Tasmania, when the reports of the Examiners in the different subjects were received. This was the first Examination under the Dentists' Act, and two candidates presented themselves, both of whom seem to have done well, Mr. Wells obtaining 688 marks out of a possible 750, and Mr. Galvin 602. Two separate Examinations have to be passed before the diploma is granted, one at the end of the first year's course, and the final at the end of the second year. We print elsewhere some of the questions set at the above examination, and, as will be seen, they are upon the first year's subjects.

THE HARMLESS AND NECESSARY TOOTHBBUSH.—An evening newspaper, in alluding to a prisoner whose case has been much discussed, takes the opportunity of preaching a little sermon on the hygiene of the mouth. It seems to be against the prison regulations to supply tooth brushes, and the paper remarks:—"The authorities insist most strongly on personal cleanliness of the body, and to leave out of consideration the care of the mouth, which is quite as important to the maintenance of good health, is surely illogical." Might we also suggest that to supply medical supervision, and to neglect to provide dental assistance is quite as bad, but perhaps the day may come when part of the "close time" of the prisoner may be occupied in having the ravages of caries attended to before he rejoins the busy outside world.

With regard to the toothbrush, we can quite understand its being withheld in lunatic asylums, or a prisoner might be suspected of a suicidal tendency. In the *British Medical Journal* is to be found an illustration of a full sized spoon which was withdrawn from the lower end of the œsophagus in an insane patient who did not present any extraordinary symptoms, and in the Museum of the College of Surgeons is a preparation showing a large spoon which had passed the pylorus, and is *in situ* in the intestines.

MR. LABOUCHERE AND MR. SEWILL.—The *Journal of the British Dental Association* for January published, as an original communication, "The Ethics of Newspaper Proprietorship," written by "a Past President of the Odontological Society." In this article, allusion was made to a paper containing editorial remarks, condemnatory of the proceedings of certain persons, who, nevertheless, were still allowed to make use of the advertisement columns of the same paper. Mr. Sewill, it seems, writing from Bournemouth, sent a copy of the Journal to Mr. Labouchere suggesting that he would institute "a thoroughly purgation" of the advertisement columns in *Truth.* The astute editor replied with one of his characteristic pieces of writing entitled "A Dentist on the Warpath," in which neither the Past President nor the Journal of the B.D.A. received much mercy. After the decision in the Court of Appeal, there appeared in *Truth*, of March 31st, another article, upon "The High Crime of Advertising," in which Mr. Labouchere asks Mr. Sewill a string of questions: (1) whether he was or was not the author of the monumental discourse on advertising in the Journal of the British Dental Association; (2) what facts he knows in support of the libellous imputations in that paper upon those dentists who have advertised in *Truth*; (3) whether he himself has or has not been on terms of intimate friendship with any advertising dentist; and (4) if he has, whether he does not think that a little of the fiery zeal which he blew off in the Dental Association Journal would have been more profitably expended in his own domestic circle? A paragraph in *Truth* of the 7th inst., states that Mr. Sewill has answered the appeal made to him, but, that as the matter requires lengthier notice, the publication of Mr. Sewill's letter is postponed till next week. As the date of publication corresponds with our own, we are unable at present to carry the history of this correspondence further, but it is stated that Mr. Sewill admits that he was the Past President, and, since notice has been taken of the challenge, we shall, in common with our readers, look forward to next week's *Truth* containing a complete vindication of the position taken.

TO THE HOUSE OF LORDS.—We notice that the Plaintiff in the recent Appeal case, has addressed letters to the Press requesting assistance in the formation of a "Dental Defence Fund" with the object of taking the case to the House of Lords. If one might rely upon a similar common-sense expression of opinion when judgment is delivered, our readers might, perhaps, feel tempted to subscribe to such a Fund. However, nothing could improve upon the line taken by the Master of the Rolls.

Abstracts of British & Foreign Journals.

SUPPURATION IN THE ANTRUM OF HIGHMORE.

By A. Brown Kelly, B.Sc., M.B.

(*Concluded from page* 320).

Another method of diagnosis is that of aspiration of the antrum, introduced by Schmidt* in 1888. The instrument employed is a Pravaz's syringe connected by means of a bayonet joint with a strong cannula, which is bent like a Eustachian catheter and sharp pointed. After the inferior meatus has been thoroughly anæsthetised with cocaine, the end of the cannula is passed below the inferior turbinate to a distance of about 1¼ to 1½ inch from the anterior nasal spine. Here the sharp point is pressed upwards and outwards against the outer wall of the nose—*i.e.*, the partition between the nose and the antrum. A little force usually suffices to pierce this bony plate. If on aspiration pus be obtained, the diagnosis is made. If no pus appear, then, as a confirmatory test, we may employ a method lately advocated by Lichtwitz†—viz., exploratory washing of the cavity. To carry out this procedure simply detach the syringe and leave the cannula *in situ*, then having filled it with a weak, tepid solution of boracic acid, reconnect it, and discharge the solution into the antrum. Any pus that may be present in the cavity will be carried by the stream through the natural orifice into the nose, and thence into the vessel which receives the washings.

The first objection to exploratory puncture, simple though it be, and devoid of danger, is that some patients, regarding it as an operation, will not submit to it

The second objection is that we may be unable to reach the antrum, because either the internal conformation of the nose prevents us introducing the instrument, or having got it properly into position, we are unable to penetrate the cavity

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*Berl. Klin. Wochenschr., No 50, 1888.
†Bull. Medical, No. 86, 1890.

owing to the thickness of the partition. It is often in those cases in which we are unable to perforate that we have most need of this test. I shall explain this by briefly describing a case. In this patient from a few vague symptoms I was led to consider the possibility of antral disease being present. I applied the method of transillumination, and found the red tache corresponding to the antrum on the one side normal, but on the other completely absent. I then tried to aspirate the antrum on the dark side, but was unable to pierce the wall. The only means that now remained to me of clearing up the diagnosis was to open the antrum from the mouth, and fortunately for this purpose it was unneccssary to extract a tooth. I therefore drilled a passage though the alveolus into the cavity, but found not a trace of pus. In this case probably the antrum on the suspected side was small, with thick walls, hence the absence of the bright tache on that side, and my inability to reach the cavity from the nose.

Other obstacles to the performance of aspiration are—inspissation of the secretion, so that it cannot be withdrawn; or its scantiness, so that the surface is beneath the level of the cannula. In either case, however, its presence may be proved by Lichtwitz's exploratory irrigation.

These methods, together with the examination of the nose, are of most service in diagnosing antral suppuration. Numerous other aids have been recommended, but these are either without value or difficult of execution—e.g., percussion (Link*), auscultation (Bermond†) probing the opening (Hansberg‡) sponging, or aspirating through the natural orifice (Bresgen §), washing out through the normal orifice, or through a foramen accessorium, or by means of an artificial opening in the middle meatus (Hartmann‖) injection of peroxide of hydrogen into the cavity, so that if pus be present it will be driven out and fill the nose with white foam (Moreau Brown ¶).

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* *Wiener Klin. Wochenschr.*, No. 31, 1888.

† Mentioned by Jeanty, *De l'empyeme latent de l'antre d'Highmoro*, 1891, p. 51.

‡ *Monatsschr. f. Ohrenheilk*, Nos. 1 and 2, 1890.

§ *Therapeut. Monatshefte*, March, 1888.

‖ *Berl. Klin. Wochenschr.*, No. 21, 1884,

¶ *New York Med. Jour.*, 19th July, 1890 (abstract in *Jour. Laryngol, and Rhin.*, 1890, p. 520).

TREATMENT.

It has been recommended that in treating this disease the cavity should be cleansed by allowing fluids to flow in from the nose. When we consider, however that the mere sounding of the orifice with a fine probe is difficult, or impossible,* it is evident that, excepting in a few favourable cases, and where the surgeon possesses special manipulative dexterity, some other method had better be adopted. Further, since the disease is often of such an obstinate nature as to require constant treatment for months, it is advisable to provide at once for such a contingency by establishing a counter opening through which the irrigation of the antrum can be comfortably carried out either by the surgeon or by the patient himself.

A counter-opening may be made either from the mouth or from the nose.

In the mouth one may operate either from the canine fossa (Desault), or from the socket of a tooth (Cooper).

The canine fossa is chosen when the teeth are gone, and that part of the alveolar process underlying the antrum is absorbed, or when it is undesirable to extract a tooth.

If the antral disease can be traced to a dental affection, then the tooth or teeth which were the exciting cause should be removed, and the counter opening made through the floor of the socket. If all the teeth underlying the antrum are apparently healthy, it then comes to be a question whether a sound tooth should be sacrificed. Whether the canine fossa or an alveolus be chosen a passage is bored into the antrum with a small hand drill, or with a burr driven by a dental machine, or by an electric motor.

In the majority of cases, the opening is made from an alveolus. This being done, two indications must be kept in view—(1) To promote the escape of the pus; (2) to prevent the passage of particles of food from the mouth into the cavity.

A fine india-rubber drainage-tube is unsuitable, because the least pressure causes collapse of its walls; it is also necessary to have a thread attached to it passing out at the corner of the mouth. If this precaution be not taken, the patient may some day come with the story that he has swallowed the tube while asleep. One of my patients asserted that this had occurred in his case. It turned out, however, that the tube had slipped into the antrum, as was proved by its being driven into the nose on washing out the cavity.

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* Hansberg succeeded in probing the antral orifice in two-thirds of the cadavers examined by him (*op. cit.*, p. 6). Owing to the great roominess of the nasal passages, this manœuvre is much easier on the dead than on the living subject.

Perhaps the best kind of drainage-tube for this purpose is Ellis's coiled wire. This retains its position very well, owing to the surrounding tissues contracting upon it, and it may be prevented from slipping upwards by widening the lower coil (Macdonald).

Hajek has introduced a simple self-retaining tube, which the patient can remove and replace as he desires.

The most comfortable arrangement is to have a metal plate and tube made and fixed to the contiguous teeth by a dentist, in the manner described by Salter.*

Instead of the mouth we may choose the nose as the site for operation.

For the various intra-nasal operations, the advantages claimed for this method are :—(1) Particles of food cannot gain access to the antrum ; (2) Pus does not flow into the mouth and injure the digestion ; (3) Extraction of a tooth is unnecessary. On the other hand, the disadvantages are :—(1) Drainage cannot be so thorough, because the opening is not at the lowest part of the cavity ; (2) It is uncomfortable, difficult, and in some cases, impossible for the patient himself to carry out the after treatment.

On the whole, therefore, an operation from the mouth is to be preferred.

A counter-opening having been established, the after treatment consists in washing out the cavity with warm, disinfecting, and astringent lotions, such as Condy's fluid or sulphate of zinc. The frequency with which this should be done will be regulated by the amount of pus formed. The washing is best carried out by means of a syringe which can be adapted to the alveolar or nasal opening. As the treatment has sometimes to be continued for months, the patient usually prefers to employ the easiest measures—*e.g.*, after washing out the mouth carefully, he may fill it with the warm medicated solution, and then, by the action of the tongue and cheeks, force this through the antrum and out by the nose. A little practice enables the patient to do this quickly and effectually.

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* Salter, "Abscess of Antrum," Holmes's *System of Surgery*, vol. iv.

Another method introduced by Krause* in 1889, consists in thoroughly washing out the antrum, then drying it by blowing air through, and afterwards filling it with iodol.

Some authors† say that they have obtained rapid cures by curetting the antrum. This procedure is certainly commendable in very chronic cases when the mucous membrane has assumed the characters of a pus-forming membrane. Owing, however, to the shape of the cavity, certain areas will be inaccessible to the instrument unless the counter-opening be very large.

If the purulent secretion continue unabated, Schech‡ recommends that the drainage passage be widened or a fresh opening be made in the canine fossa, and the cavity tamponaded with iodoform gauze.

The treatment must be continued until the purulent discharge from the antrum has completely ceased. Then the drainage tube may be removed and the passage allowed to close.

DISEASES OF THE ANTRUM.

By H. H. Schuhmann, D.D.S. Chicago.

Dr. H. H. Schuhmann read a paper before the Chicago Dental Society, on the common diseases of the maxillary sinus, which was followed by a discussion. As we have published in our last and present issue an able paper by Dr. Brown Kelly, upon empyœma of the antrum, we confine our abstract from the report in the *Dental Review* to the question of treatment and the employment of a drainage tube. Dr. Schuhmann in dealing with the anatomical part of his paper, did not fail to draw attention to the presence of small projections which are frequently found on the floor of the antrum, and the loculi formed by these play an important part in the success, or otherwise, of treatment by drainage.

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* Krause-Friedlænder, *Berl. Klin. Wochenschr.*, No. 37, 1889.

† V. Dittel in discussion on Chiari's paper, *Wien. Klin. Wochenschr.*, Nos. 48 and 51, 1889; Hunter Mackenzie, *Lancet*, 7th March, 1891.

‡ *Die Krankh. der Nebenhöhlen der Nase* (2 Aufl., 1890), p. 23.

The author alludes to two points in the treatment, which, if properly carried out, will effect an entire cure in nearly every case. These are "*free drainage*" and "*cleanliness.*" No matter how extensive a treatment may be prescribed, these *two* main points *must* be followed with the *utmost* scrutiny, or there will be *no* success. Now the question is, how can both of these be obtained in the antrum of Highmore. The operation is a slight one. General anæsthesia will not often be necessary, unless an external opening should have to be made. Let us first consider the methods of opening the cavity from within the mouth (without perforating the cheek). Suppose the cause to be a diseased tooth, the first molar or second bicuspid should be extracted (judgment to be used in deciding which one. If these teeth are both sound and are not the cause of the trouble, then one of the other methods of access is to be followed). After this the floor of the antrum is to be cut out with gouges or drills, the latter instruments used in the dental engines are probably the ones more generally resorted to. The hæmorrhage will be of the capillary kind. Now there is one thing to be obtained here, and that must be kept in mind, we want *free drainage*, so let us not hesitate to make an opening *large* enough. In most cases the floor should be excavated sufficiently to admit the end of the little finger. After opening and clearing away all debris and the remains of the fluid enclosed within the sinus, all those bony septi, previously alluded to, should be broken down, not leaving any pockets for foreign matter to accumulate. Another mode of gaining access to the antrum, and a very effective one in persons of advanced age, or prominent cheek bones, is to remove the anterior wall of the cavity, you can very readily make a good sized opening and also save the teeth. Treatment of these cases ought usually to be left to the oral surgeon and dentist, as they have the proper instruments and appliances for the proper treatment. The author prefers this last mentioned mode of treatment where there is any choice, for several reasons.

The palate may be resorted to to make the opening into the antrum, but is only rarely advisable (in special cases).

Remember that as long as *free drainage and cleanliness* are obtained, the two main points have been gained. There has been still another method of tapping the antrum used by several without the removal of any teeth, by drilling through the mucous membrane and bone where the cheek and bone meet right above the second bicuspid or first molar. But this mode alone will be found inefficient in most cases, and will generally have to be followed by one of those previously mentioned in order to obtain a cure, as in order to get free drainage, the most *dependent* part of the cavity must be opened. The length of time during which this opening is to be maintained, is to be governed, of course, by the progress of the individual case. If, to make a opening, a bicuspid is extracted, the opening in the soft tissue may be enlarged by the insertion of a piece of tent-wood for two or three hours. One mode of treatment, much in vogue at present, the author thinks should be denounced most thoroughly. He referred to the extraction of a tooth and insertion of a silver tube clasped to the adjoining teeth. Anticipating a reprimand, for making this assertion, in the discussion afterwards, he gave his reasons for not believing in the insertion of a tube. If a tube is placed *in situ* it can fill but *one* of *three* conditions. It can be either *too long*, *too short*, *or just right*, and all three are *just wrong*. If the tube is too long, it will do the same as those bony spiculæ above spoken of, it will allow a certain amount of fluid to be retained below its opening ; if it is too short, the artificial opening in the antral floor will close over it, and if it just reaches the antral floor, the mucous membrane will very soon overlie its opening and form a valve through which fluids can be injected, but not flow off. Absorbent cotton is very often used to maintain the opening, but iodised lint will be found to be far preferable. Should the lint slip into the antrum, it is an easy matter to remove it by catching one end with a pair of tweezers, while, if this should happen to cotton, it will be found embarrassing and tedious to remove it from the cavity. The author then proceeded to allude to other affections of the antrum.

In the discussion which followed, Dr. BROPHY, speaking with regard to the question of drainage tubes and their use, did not agree with the essayist because, in his opinion, the advantage of a drainage tube is to secure continuous drainage. If a large opening be made, which is the proper thing to do, as had been described, making it as large as possible, so as to introduce even the end of the finger, such an opening will generally give good drainage. The drainage tube must be just right, it must be neither too long nor too short. How is the proper length to be determined ? It is a simple thing to do. If an operator takes a silver probe and bends its end so as to form a right angle, then introduce it into the antrum, he may hook it on the floor of the antrum, and by that means measure the distance between the floor of the antrum, and the masticating surface of the teeth, thus indicating the length of the tube. He may then take platinum and make a tube the right length. He should make a band in the same manner as for a crown and fit it to the tooth in close proximity to the opening or antral tube.

He can then take an impression, with moulding compound, of the tube, and the band round the tooth, seeing that he holds the tube where it ought to be. In taking that impression he removes the tube and also the band from the tooth, and makes a plaster cast surrounding them. He takes the cast to the laboratory, he puts platinum between the tube and band, and solders the two together, after which he adjusts the tube to the antrum, cementing the band to the tooth. He can drain the cavity at the most dependent part, which is at its floor. He has continuous drainage. That is the essential feature of the treatment of antral disease. When the patient is taking his food he may plug the end with a little stopper, and this may prevent the introduction of food into the antrum. After meals he takes out the plug and gets continuous drainage. The opening might be plugged with gauze, wax or anything else. Wax is clean and will not absorb anything. In those cases where there were no teeth to hold a tube, Dr. Brophy relies upon a large opening and thinks it never advisable to put a tube in a plate where the teeth are all out, as tubes thus attached are certain to produce a good deal of inflammation of the surrounding tissues.

Dr. G. T. Black felt that the essayist was right in what he said concerning the use of drainage tubes, and yet he, the speaker, had a patient then with a tube in the antrum but it was for the purpose of closing the opening, not to keep it patent. The granulations which occurred about the end of the tube would effect the closure. He did not want continuous drainage but rather periodical drainage in these cases. He prefers it closed except when under his immediate observation so that no saliva should enter the cavity at all.

Dental Review.

LINGUAL ULCERATION OF AN EPITHELIOMATOUS APPEARANCE, DUE TO AN UPPER FULL ARTIFICIAL DENTURE.

By Arthur C. Hugenschmidt, M.D., D.D.S., Paris.

The author points out that the dental specialist is often called upon to give an opinion about an ulceration of the tongue, especially as such lesions are frequently due to defects in the dental apparatus. He thinks many a patient has had his tongue removed for lingual epithelioma, when a dentist might have discovered the origin of the trouble, and by removing it, have cured the patient. He instances the following case. A lady, aged about 60, had a very marked ulceration on the dorsal aspect of the tongue, which had been diagnosed as epithelioma, by an eminent European surgeon, who recommended immediate amputation of half the tongue, and this operation was to be performed two days later. The author too, as soon as he examined the tongue, was convinced that it was an epithelioma. There was severe lancinating pain, difficulty of speech and mastication, and the tongue was very large and of a deep red or violet hue.

On examination of the lesion, there was found, at about the middle third of the organ, on the left dorsal aspect, a transverse ulceration which started from the left border, and was directed towards, and perpendicular to, the median line. This ulceration was nearly an inch long and formed a hollow cavity in the tongue tissue more than the third of an inch deep. The posterior border of the wound formed a projection, which falling forward, covered the cavity. Lifting up this projection one exposed a vast crater-like ulceration, half-an-inch broad, the bottom being covered with large granulations, surrounded by pus and bleeding very readily. There was a good deal of induration, the sub-maxillary glands on that side were affected and everything pointed in the direction of epithelioma.

In the lower jaw there were only the four incisors and right canine, the other teeth had been replaced by a partial set which fitted very nicely and which in no way came into contact with the ulceration.

In the upper jaw all the teeth had been replaced by a full suction plate, which seemed to keep well in place. There seemed no irregularity on either of these artificial pieces which were both well finished.

Whilst the patient was answering questions the author noticed her suddenly perform a rather awkward movement of deglutition. He told her to keep quiet and not to move, and on opening the mouth slowly he found the posterior palatal border of the upper artificial set caught in the ulceration between the posterior projection of the ulceration and its anterior border ; this apparatus although apparently fixed when the mouth was open became shifted by the movements of the palate during articulation and then was replaced by an instinctive movement by which the dorsal aspect of the tongue was raised.

The author alludes to the rarity of an upper piece causing ulceration of the tongue. In this case the plate was removed the mouth washed with a two per cent. solution of carbolic acid and the ulceration touched with tincture of iodine. The patient was cured in two weeks.

Dental Review.

HYPERÆTHESIA AND NORMAL SENSITIVENESS OF DENTINE

By M. G. Viau,
Professor of the Dental School of Paris.

It is surprising to find the confusion which exists in certain works on dentistry as to the normal sensitiveness and the pathological sensitiveness of dentine. The words hyperæsthesia and sensitiveness seem to have an identical meaning and to correspond to an organic process exactly the same. Whenever dentine manifests a natural and absolutely normal reaction against external influences it is spoken of as hyperæsthesia, and it seems to be forgotten that this tissue is an organic, living substance provided with elements which receive impression, and that, consequently it possesses in a physiological condition its natural sensitiveness. This is an oversight against which the author protests, for it is not a question of terms but rather of different organic phenomena which must be considered from a practical point of view.

For him, hyperæsthesia of dentine is a rare, or at least infrequent occurrence; whilst sensitiveness is constant and necessary. Its absence would be abnormal and would result either in an anatomical alteration of the dentine substance or in a degeneration or total absence of the central organ. This physiological sensitiveness necessarily varies according to the particular susceptibility of the individual. Strictly speaking the dentine is normally covered by a protecting layer of enamel and is not called upon to bear the contact and immediate impressions of external agents. Extreme increase in the ordinary sensitiveness, when it can no longer bear the slightest impressions, is an indication of the superexcitation of the central organ and it is this condition which should be considered as a real *hyperæsthesia* of the dentine.

True hyperæthesia of dentine necesarily presupposes that of the pulp, and when this exists it presents altogether different charactistics to that found in normal sensitiveness. There are generally the symptoms of a commencing pulpitis.

It is easy then to understand the difference of the therapeutical indications. Whilst in order to diminish the normal sensitiveness one would resort to caustics &c., applied to the sensitive surface, morbid sensitiveness or hyperæsthesia of dentine, indicating over stimulation of the vasculo-nervous organ, would demand above all, an anti-congestive, quieting treatment; any application of a caustic would be prejudicial to the vitality of the central organ.

L' Odontologie.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, March 7th, 1892. Mr. J. Howard Mummery, M.R.C.S., L.D.S., President, in the chair.

The Minutes of the last meeting having been read and confirmed,

Messrs. E. W. Roughton, M. Y. Woolf, and Percy Smith signed the Obligation Book, and were duly admitted to membership by the President.

The following gentlemen were ballotted for, and elected :—

Resident Members :—Messrs. T. H. G. Wrighton, L.D.S. Eng., 7, Bloomsbury Square, W.C. ; C. J. Blaaberg, L.D.S. Eng., 2, Argyle Square, King's Cross, W.C. ; A. R. Colyer, L.R.C.P., M.R.C.S., L.D.S. Eng., 66, Christchurch Road, Tulse Hill ; H. A. Forsyth, L.D.S. Eng., 23, George Street, Hanover Square, W. ; W. S. Holford, L.R.C.P., M.R.C.S., L.D.S. Eng., 23, Wimpole Street, W. ; Edmund Balding, Junr., L.D.S., Eng., 732, Holloway Road, N. ; George Hern, L.R.C.P., M.R.C.S., L.D.S., Eng., 18, Stratford Place, W. ; P. L. Webster, L.R.C,P., M.R.C.S., L.D.S., Eng., 2, Redesdale Terrace, Canfield Gardens, N.W.

Non-Resident Members :—Messrs. F. H. Ellwood, L.D.S. Ire., Granville House, Redhill, Surrey ; R. E. Waller, L.D.S., Eng., Cairo, Egypt ; M. F. Hopson, L.D.S., Eng., The Croft, Newbury, Berks.

The Librarian, (Mr. Ashley Gibbings), then announced he had received between February and March, 1892, the Calendar of the *The Pharmaceutical Society of Great Britain*, 1892 ; a paper by Sir John Tomes, F.R.S., reprinted from the *Quarterly Journal of Microscopical Science*, Vol., iv., on "Certain Conditions of the Dental Tissues, and on the Structure and Development of Enamel ;" "Anatomy, Physiology, and Diseases of the Teeth," Thomas Bell, 1826, presented by Mr. C. Robbins. Received between January and February, and not reported to the Society in February : "The Human Teeth," by Hunter, 1771, and "Principles of Dental Surgery," by Leonard Kocker, 1826, presented by Mr. C. Robbins ; Lectures on the "Diseases of the Jaws," delivered at the Royal College of Surgeons, 1887, presented by Mr. Christopher Heath ; and *Transactions of the American Dental Association*, 31st Annual Session, August, 1891.

The Curator (Mr. Storer Bennett) announced that three specimens had been added to the Museum. Mr. Quinby (Liverpool) had presented a plaster cast, &c., of an inferior maxilla. Mr. James Hoare had presented two specimens, one an upper model, showing a conical supernumerary tooth which had been extracted, and which accompanied the model. The second was a right upper wisdom tooth, which in extraction brought away the tuberosity of the superior maxilla.

Mr. F. Newland-Pedley showed a dry specimen of sequestrum from the buccal surface of the alveolar process in which a gold filling had been inserted.

Since the last meeting of the Society, Mr. Newland-Pedley had seen a patient, who complained of a little hole in her gum from which there was an offensive discharge. She said there had been a gumboil over the root of an upper back tooth, which had led to the existing condition. The patient consulted her dentist about the disagreeable discharge, and about fifteen months ago he inserted a gold filling in the little hole in the gum. On examination of the mouth Mr. Newland-Pedley found the gold filling inserted in necrosed bone, and with the aid of a little cocaine removed the small sequestrum with the filling *in situ.* The specimen and model of the mouth are shown. The dentist was said to have a large practice in one of the favourite suburbs of London.

Mr. W. A. Maggs wished to know how long the filling remained there, it was apparently not that which caused the necrosis.

Mr. Newland-Pedley replied that the filling was done fifteen months ago, and in a spirit of charity, which it was hard to extend, he tried to believe that the bone was necrosed.

Mr. R. H. Woodhouse asked if Mr. Newland-Pedley happened to know whether the adjoining teeth were dead ?

Mr. Newland-Pedley stated that the teeth on neither side were dead, he had seen the patient only that day, and found that the dentist had drilled in between the roots.

Mr. E. W. Roughton read "Notes of a Case of Sarcoma of the Hard Palate," and said:—

J. Tomlin, a labourer, 74 years old, was admitted under his care at the Royal Free Hospital, on April 27th, 1891. Early in February, 1891, he noticed a small, hard, painless lump in the roof of the mouth. He showed it to a chemist, who gave him some medicine te cure it. On April 23rd, he was seen by Mr. W. T. Fisk, L.D.S., who at once recognised the nature of the disease, and transferred him to Mr. Roughton's care.

When admitted to the hospital, the lump in the mouth was about the size of a hen's egg. It was growing apparently from the periosteum of the hard palate, on the left side, transgressing the middle line, and encroaching upon the palate process of the right superior maxilla. It was smooth and hard, but decidedly elastic to the touch. The soft palate was unaffected, and there was no evidence that the antrum was involved. The upper jaw was completely edentulous.

There was no enlargement of lymphatic glands, and the general health was very good.

On April 29th, the patient was anæsthetized, and Mr. Roughton made an incision over the tumour, and shelled it out. The finger inserted into the cavity thus made, discovered that the palate had been perforated by the disease, and the antrum thereby involved. The upper lip was reflected and a saw inserted into the left side of the nose, the superior maxilla sawn through horizontally, just above the level of the palate process. Having removed the left half of the hard palate, Mr. Roughton chipped away enough of the right palate process to completely remove the disease. The patient bore the operation very well, and within a week was well enough to get up. However, twelve days after the operation, without discoverable cause, his temperature suddenly ran up to 103$_o$, and he became delirious. On the next day the temperature reached 105$_o$ and he died without developing any further symptoms to elucidate the cause of the fever. The *post-mortem* examination did not help to determine the cause of death. The brain was healthy, the lungs, although somewhat congested at the bases, were crepitant throughout, and free from any inflammation or purulent condition, with the exception of the bladder, which was hypertrophied as the result of an enlarged prostate, the other organs were natural. At the time the patient was in the hospital, influenza was very prevalent. For want of a better explanation it was concluded that he caught the disease, and being an old man and depressed by a severe operation, he succumbed to it.

The microscopic examination of the tumour showed that it was a sarcoma composed of small round cells, with a few myeloid cells scattered here and there.

His chief reason for bringing this before the Odontological Society was, that he felt very strongly that the subject of malignant disease of the mouth could not be introduced to the notice of the dental surgeon too often or too forcibly. The early stages of cancer of the mouth often cause so little trouble and inconvenience, that the patients put off seeking advice until the disease has extended beyond the range of operative treatment. He imagined that dental surgeons whilst operating on the teeth must frequently see disease for which they are not consulted. In such cases the responsibility was very great, for, unless they warn their patients that prompt treatment was necessary they are allowing the disease to advance to a stage when surgery can do nothing, and the only result can be a painful death.

Mr. SIDNEY SPOKES, commenting on Mr. Roughton's remarks as to the importance of the dental surgeon recognising conditions of the mouth which would not properly come under his treatment, said, a short time ago he saw a man who came to him for the extraction of a lower molar ; he presented certain symptoms, and Mr. Spokes discovered a large lump on the left side of the tongue. On further examination, it turned ont to be a very bad case of epithelioma which had got beyond the stage of treatment, and the surgeon refused to operate. Here was a case in which the patient discovered nothing for himself, and circumstances only came to light when the disease had gone too far to be dealt with.

The President said that Mr. Roughton's case was a very interesting one ; if there were no further remarks he would call upon Mr. Robbins for a casual communication.

Mr. CORNELIUS ROBBINS said that it was so small a matter that he had to bring to their notice that he almost felt he ought to make an apology for doing so, but their daily practice was made up of small things. For a long time he had been dissatisfied with the large Gutta Percha heater of Flagg's, he had, therefore contrived a simple arrangement which could be fixed to the shield of a spirit lamp : the Dental Manufacturing Company had made the one which he exhibited, and being simple and small he did not think it would cost much ; he should mention that it was not advisible to fill it quite full of water, and the easiest way to fill the reservoir was with a syringe.

The PRESIDENT thought the contrivance very compact and useful.

Mr. GEORGE BRUNTON, of Leeds, showed a small apparatus which he had used for about six months for keeping pellets of Japanese Paper hot ; it consisted of a small oven jacketed with water, and kept hot by a spirit lamp, he found in practice that only one ounce of water evaporated in eight hours. There were two compartments, the top for heating gutta percha, and the other for "Flagg's High Heat," he also found it useful as a vaporizer.

The PRESIDENT said that as they had no promise of a regular paper, it was proposed to have a discussion on irregularities, associated with anterior protrusion of the upper teeth.

Several gentlemen had offered to speak and Mr. David Hepburn had kindly undertaken to open the subject. As the subject was a very wide one, it was intended to strictly confine the discussion to those associated with the anterior protrusion of the upper teeth.

Mr. HEPBURN'S remarks appear on page 337 of our present issue.

The PRESIDENT invited Mr. Woodhouse to continue the discussion. Mr. Woodhouse said that he rather wished first to hear what others had to say on the matter, they each had their own views and he did not wish to obtrude his without hearing what plans others adopted. The introduction which they had just heard was an exceedingly good and learned one, but he should have been glad to hear of the means which Mr. Hepburn adopted when he used mechanical force; in his (Mr. Woodhouse's) own time he had used various forms of force, and had now come to use almost exclusively elastic gold springs: these were first introduced to him by the father of their President. As to leaving matters to Nature, he entirely agreed with Mr. Hepburn that nature did very much of herself, but he thought that they should aid her. He had here a model (shown) of a case in connection with which there was no history of hereditary protrusion; it had at first appeared hopeless. They might perhaps see the protrusion of the teeth entirely disfigured the mouth, and the lower incisors impinged on to the gums about $\frac{1}{16}$ of an inch inside the tuberosity of the upper incisors. His plan was to cap the six-year-old molars and bicuspids, and allow the twelve-year-old to grow, he then removed the first bicuspid—the second was often the best—and also removed the first bicuspid in the lower jaw; he put vulcanite plates with the gold springs, of which he had spoken, to bring back the teeth in both jaws. He would mention that in his opinion it was extremely important not to attempt to bring back more than one or two teeth at a time, otherwise one would bring the back teeth forward. This case was treated in 1882, and the patient had now a very presentable appearance; the lower teeth do not impinge on the gum at all, and the upper incisors have been brought in $\frac{3}{8}$ of an inch—which makes a great difference in the mouth. He should state that it was most important to begin at the right age, he never began until the twelve-year-old molars had erupted, one was often importuned by anxious mothers to begin too soon, but he never did so. While on this subject he wished to bring before them a plan which he had adopted for some time, and which he had found most useful. Of course they all knew that when the first molar is taken out the twelve-year-old molar is extremely prone to come forward. It occurred to him some years ago to make a plate, such as represented on the model, to prevent its doing so (shown). The impression was taken from the mouth when the plate was *in situ.* The plate rested against the neck of the upper incisors and fitted the front and both sides of the second molar. He would here remark that in making a case of this kind he carefully trimmed up the model himself. It required to be done very nicely, so that the vulcanite clasp catches the inside of the neck of the tooth, and the flattened pin wire goes round and grips the tooth on the outside. As one treats the upper jaw so the lower jaw should be treated as regards the removal of corresponding teeth, but as the lower bicuspids have a much greater tendency to retreat than the upper, a retaining plate is not necessary for the lower twelve-year-old molars. The first cases that Mr. Woodhouse had of this kind were of two young ladies going abroad. It occurred to him to treat them in this way, and he did so. The mouths were very crowded, and he put a plate into each mouth. He did not see them for a year and a half, and, to his great delight, at the expiration of that time the mouths had assumed a normal condition, all the teeth being in their proper position. He would trespass no longer upon the time of the Society.

The PRESIDENT remarked that this plan of Mr. Woodhouse's seemed most admirable, and would get over a great many difficulties; he would now call upon Mr. Walter Coffin.

Mr. WALTER COFFIN felt the impossibility of adding to Mr. Hepburn's remarks as to the etiology of the conditions met with in the protrusion of the superior teeth, but was sure that the stress laid upon the artificial causes by Dr Chandler and Mr. Quinby was not now much considered. He (Mr. Coffin) would like to say how strongly he felt with Mr. Hepburn as to the tendency of many cases to improve in the course of time, and he had hoped that some agreement more or less might be come to among the members of the profession on this point, in order that when one was pressed by parents to commence work too early one might feel that one had the support of professional brethren in resisting importunities.

Mr. Woodhouse had shown them how the mechanical appliances must be governed by very careful consideration, in order that they might do good instead of harm. Of course it was not necessary to say that plates capping all the posterior teeth did more harm than good. Possibly many mechanical contrivances might not accomplish more than a waiting policy would do, but at the same time, in waiting for things to improve much, one was often disappointed. He had a case of his own in his mind, of a girl aged 19. The deformity had not improved to any appreciable extent, and when he was called upon to treat the case, had felt justified in doing so. The case was complicated by the fact that the lower teeth impinged on the lingual margins of the gums, and one had to open the bite artificially, and in a careful way, to ensure a permanent opening in the manner which Mr. Woodhouse had pointed out. In this case the teeth were brought back. There was no difficulty in doing this, but it was the permanency of these results which was a matter of doubt. In this case the patient wore a plate for seven or eight years. She who was a girl was now a woman of thirty. There had been no tendency for the front teeth to resume their former position. He attributed this to the same causes which produce spontaneous improvement. Wearing a plate long enough seemed to ensure a successful result. He thought something more might be said of the discrimination and classification of cases. They saw cases of slight spaces between the front teeth ; in others there were no spaces. Then they saw cases where the lower teeth impinged, and where they did not, and these cases must be considered each in the light of their special circumstances. He did not think that much could be added to what had been said, except that he thought that some middle ground might be found between those who thought it was very rarely possible to assist nature and those who thought it was well to commence when the twelve-year-old molars had erupted. As to mechanical contrivances he felt sure that most practitioners had arrived at the conclusion that elastic ligature, india-rubber bands, and such more or less unstable appliances, did more harm than good, and that unless the contrivance could be a plate which could be self-contained, rigid, and not easily put out of order, it would be better not to do anything at all. Many must have been disheartened, and disinclined from experience to fall back upon easy contrivances. These cases were undoubtedly those which gave the greatest anxiety and embarrassment, both in advising patients and making up their own minds in following a course of treatment. In deciding between the two schools, it was certainly very difficult to say to the young practitioner who had used his plates, that equally good results would have come about without the plates. It was impossible to say how much had been due to the plate, and how much to the working of nature. If they studied the construction of plates very carefully, they would see that suitable plates, if not actually assisting nature, would not hinder her. They must all have seen plates which they were obliged to condemn, and he thought that concentration on this point of regulation was a very great advance in the discussion as to the desirability of attempting any mechanical amelioration of conditions.

Mr. GEORGE BRUNTON exhibited a model showing the protrusion of the teeth before treatment. The six-year-old molars being decayed, were removed, and expanding plate was inserted, and after the jaw was sufficiently expanded, all the upper nine teeth were drawn back simultaneously by one apparatus ; he had not the apparatus with him, he had made a search for it but was unable to find it, the upper left canine was missing altogether, but one thing he should like to get a little information about, and he had no doubt that many of those present could tell him how the thing could be done or help him in some way ; they often noticed that if they had regulated a case, the tendency of the twelve-year-old molars to tip inwardly towards the tongue, and the result was that one got a bad articulation, of course that was due to their coming forward, but if any gentleman could suggest either a remedy, or suggest at what age the six-year-old molars should be taken out, he should be glad to hear it. One thing struck him in the case Mr. Woodhouse was good enough to show, and that was how did the upper teeth thus travel back without the bite being "jumped" as it is called, because one would think that the articulation of the lower teeth would prevent the upper teeth from falling back. While upon the subject, he would like to show the labels for regulation of cases which had been prepared for the annual meeting of the British Dental Association. (labels shown.)

Mr. MORTON SMALE asked what kind of apparatus it was which Mr. Brunton used to draw back the nine teeth simultaneously ?

Mr. BRUNTON replied that the arch was expanded first of all by a split plate and afterwards a vulcanite plate was made to fit the upper, extending as far back as the twelve-year-old molars, wires were attached to the plate coming in front of the first and second bicuspids, the same on either side, and a wire from each side to go round in front, these wires were bent in from time to time; that was the only apparatus that was used. (Mr. Brunton sketched the apparatus on the black-board.

Mr. WOODHOUSE feared that he had not made himself sufficiently clear when speaking of the fact, that when the first molar was removed in the lower jaw as well as the upper jaw, the lower bicuspids moved backwards much more readily than the upper, and required no treatment from a plate.

In answer to a question from Mr. Lawrence Read,

Mr. Woodhouse said that when he wanted to raise the twelve-year-old molars, he put a plate on the first molars and bicuspids, which kept the mouth open; the twelve-year-old molars then grew down. He differed from Mr. Brunton; his (Mr. Woodhouse's) plan was to get more resistance behind than could be exercised by the springs, thus insuring the front teeth going back rather than the back teeth coming forward.

Mr. STORER BENNETT said that associated with the deformity in question it would frequently be noticed that the lower jaw was short and square, the lower incisors in some cases standing very high, thus increasing the already oblique direction of the upper ones. In consequence of the disproportionate smallness of the lower jaw, compared with the upper one, the lower lip dropped between the two sets of teeth, pushing out still further the uppers. In addition to all this, it would generally be noticed that the upper lip was short, so that it was unable to exert a controlling influence on the crowns of the upper incisors. Indeed, when the obliquity had advanced to a certain degree, the short upper lip was so pushed up as to press on the roots of the teeth instead of their crowns, making matters worse than ever.

In spite of the adverse opinion Mr. Coffin had expressed for all forms of india rubber in the treatment of such cases, he had great faith in the use of a broad band of rubber dam stretched across the fronts of the upper teeth and attached to the buccal surfaces of a plate on either side, the band being sufficiently wide to drop well below the upper incisors.

This, while pressing in the upper teeth, dropped behind the lower lip, and so prevented it impeding their inward movement.

The Secretary read a letter from Mr. J. C. Storey, of Hull.

"Dunallan House, Regent Terrace, Hull. March 5, 1892. Dear Sirs,—I much regret that I am prevented attending the meeting of the "Odonto" on Monday evening. I have, however, sent two pairs of models which are fairly typical of several cases I have regulated on the same plan. One case (Edith R.) was retracted without extractions in three months --two years ago. She wore a retention plate for twelve months, at nights only, and the case remains perfect, as shown in the second model. The other, Master H S., had complications, as in both the upper and lower the arch required widening. This is, however, I think, fairly satisfactory. The plan of regulation was in each case a piece of D. A. struck up from casts to accurately fit the front of the teeth. This was attached by means of elastic ligatures to a vulcanite plate, capping the back teeth, with vulcanite flanges above the molars to receive the attachments. Of course the vulcanite plate left the anterior portion of the palate free so as not to form a resistance to the backward pressure.—Yours very truly, J. CHAS. STOREY.

Mr. R. H. WOODHOUSE said that the discussion had turned on bilateral protrusion of front teeth, but there was one form, viz., unilateral protrusion which was very troublesome. It was generally associated with the central and lateral incisors on the right side of the upper jaw, and was most frequent in adult life. He had had several cases himself but did not know of any successful way of treating them. He found in a few cases that a good effect had been produced by lessening the length of the central incisors. That this irregularity should be more frequently seen in the right side of the upper jaw was rather a puzzle. Many cases which he had in his mind at the moment were, he thought without exception, on the right side. It had struck him that possibly this might be produced by the action of the tongue, which he believed followed the movement of the jaw. From careful observation it would be noticed that the jaw moved in one direction when masticating, viz., from left to right, and the tongue participated in this movement. This tended to exaggerate the protrusion of the incisors to which he had been referring. He did not know that there was any successful method of treatment in these cases, but he thought it was worth mentioning.

Mr. W. HERN said, that there was one case of protrusion occurring, not so much in youth, as in young adult or in adult life, in which the patient complains that his or her front teeth are becoming more and more prominent; in these cases the molar teeth commonly occlude normally, and the lower incisors do not impinge on the lingual surfaces of the upper. On examination of the mouth it would be found that this state of things was due to pyorrhœa alveolaris, the disease,as is usual,affecting the sockets more on the lingual and interstitial aspects than on the buccal. It appeared that chronic congestion tended to separate and throw the teeth forward. He would like to say that his experience, small though it was, confirmed what Mr. Hepburn said as to Nature working the cure in certain cases of anterior protrusion—especially those in which the protruding teeth are spaced. A relative of his own had protrusion of the front teeth which had become very much less marked as she grew older. He thought that it might be explained to some extent, in this way; that when the child got old enough to have any regard for its personal appearance it tried to cover up the deformity by habitually closing the lips, thereby throwing a stress on the upper incisors, and tending to throw them back. Before sitting down he should mention that Dr. Talbot, an American writer and careful observer, had written largely on the subject of protrusion of the front teeth, and he thought his classification was very good.

Mr. BETTS thought that no one had alluded to the method of using a flat wire with a nut and screw at the side. He had come to the conclusion, that in the majority of cases, a piece of flattened wire with a screw and nut, so that the child, with a turn of the screw from day to day, could keep the pressure constant. was a rapid means of regulating. Then again, he thought in these cases that the reason they were so often unsuccessful was, that the lower incisors impinged on their antagonists. A good plan was to grind them a little with a corundum wheel when the case is completed.

Mr. S. J. HUTCHINSON said that there was one point which he should like to mention. No one could doubt the advantage of capping the lower bicuspids and first molars, to get the twelve-year-old molars to rise. He should like to mention that not only could the bicuspids and first molars be capped, but also the tips of the lower incisors, as so to prevent them from rising, and thus obviated the necessity of grinding them as Mr. Betts suggested.

Mr. WALTER COFFIN said—if he might be allowed to speak again—in the course of drawing back the incisor teeth it was found very simple to apply an axial force to push them up into their sockets, and it was astonishing how easily the incisors would respond to the force and keep in their position ; he had often helped a case materially by pushing up incisors which would have been too long.

Mr. BALDWIN, referring to the remarks that had been made against the use of elastic bands, said there was one case in which rubber could be used very advantageously, and that was in anterior protrusion of front teeth. Here a strip of rubber-dam, buttoned on to the sides of a plate and stretching in front of the six upper front teeth, not only pulled the teeth backwards but also pulled them upwards into their sockets if the buttons were placed high enough, and thus obviated or reduced to a minimum their lengthening from bringing them from an oblique to a vertical position. The rubber, if brought below the tips of the teeth, would curl round them, acquiring a very strong hold upon them, and showing no tendency to slip up towards the gum. It seemed to him the meeting had not received a clear idea of when these cases should be undertaken mechanically and surgically, and when not. He thought no one there would advise treating these cases until the time when all the teeth had been cut except the wisdom tooth. Then if the lower lip were resting behind the upper front teeth, or if the deformity were considerably apparent, the case should be undertaken. If the teeth were not interspaced, something on each side must be extracted. He himself felt that the six-year-old molar was the worst tooth to extract, unless it were very badly carious—dead, or pulp exposed. Besides the well-known reasons for this, there was the additional one that the six-year-old molar was a much more powerful support to the bite than any other, and therefore prevented the bite from closing abnormally, and in the majority of these cases increasing the deformity by causing the lower front teeth to impinge on the backs of the uppers. He thought the first bicuspids were, as a rule, the best teeth to extract.

MANCHESTER ODONTOLOGICAL SOCIETY.

The usual monthly Meeting of the members of the Society was held on Tuesday evening, February 2nd, at the Grand Hotel, Aytoun Street. The President, Mr. I. Renshaw, was in the Chair.

Mr. **Minshall** read a paper on "Some points in Contour Filling." (See page 341.)

Discussion.

The discussion was opened by the President, who said that Mr. Minshall, in his admirable paper, had gone over ground sufficiently ample to afford them room for plenty of discussion.

Mr. S. **Wormald** (Stockport) said the paper opened out a wide field, and one upon which it was difficult to come to any definite conclusion. The pathological and physiological facts relative to teeth, and their connection with the alveolar process, was one of the most difficult things which could be brought before them for discussion.

Mr. **Collett** said that the diagram showed them pretty clearly, in certain cases, the necessity of having a contour filling. The way in which it was shown how the upper teeth articulated with the lower ones, tended, to his mind, to show the necessity of building up the full contour.

Mr. P. **Headridge** said the paper unmistakeably showed a very great deal of practical knowledge on the most vital points of contour filling. With regard to flat fillings, he thought that where an ample V-shaped space could be formed between two teeth in such a manner that the tongue could keep it perfectly cleansed and free from food then flat fillings would stand, even in very delicate teeth. Then as to contouring, they had first to consider the tooth generally as to the character of the enamel, and as to the strength of the tooth. If they "contoured" some fillings, they found in the course of twelve months, if the walls were frail, the signs of disintegration had set in. There were other teeth which they could work to the finest edge, contour them, and they would stand for many years. That was one point to be considered; they must always take into consideration the character of the teeth. Another important point was the cervical edge. They must have the cavity so formed, that they could get their instrument working direct before they began to build up the filling. That was the principal thing so far as anchorage was concerned. Another point was that the filling should be laid in even layers. They must also take care in finishing the filling to leave it in such a manner that no undue pressure should be directed against it by the antagonising teeth.

Mr. **Whittaker** criticised the specimen Mr. Minshall had shown in which a wall of gold was first built up forming the contour of the tooth, leaving the main portion of the filling to be inserted afterwards, like an ordinary crown filling. He thought the wall of gold thus built up would not stand much pressure from within, and that there would be danger of its breaking down when packing in the rest of the filling. He preferred to use gutta-percha as a means of separating back teeth, by putting it between the teeth and allowing the patients to bite down upon it. He did not advocate flat fillings made of amalgam, as he thought they had a tendency to assume a spherical form. When they made a flat stopping of amalgam, the amalgam had a tendency to shrink away from the sides, an objection that was obviated by contouring.

Mr. G. G. **Campion** agreed with Mr. Minshall that in a very great many cases, contour fillings were preferable. There was one class of cases, however, in which he thought flat filling was best,—cases where the gums had receded in old or middle-aged people. In such cases, contour fillings might act rather as a trap for food, the food being drawn between the teeth, and lodging in the space at the neck. In such cases, he (Mr. Campion) thought interstitial decay was better treated with flat fillings, although, of course, they must be quite sure that there was no tendency for the teeth to approach one another. In young people, in whom the wisdom teeth had not erupted, contour filling was essential, because any spaces left would be filled up by the teeth approaching one another, and the last condition would be worse than the first. Then in regard to the shape of the fillings. The shape of the contour filling should reproduce, as far as possible, the natural surface, so as to prevent the food being driven down between them. They might have two teeth in contact, and owing to a wrong shape being given to the contour filling, food might be driven down between them. He fancied that was not so much due to the absence of the approximal ridge, as mentioned by Mr. Minshall, as to the fact that the lateral contour of the filling was not right. Mr. Minshall also said that he preferred using the separators for gold fillings, and slow wedging for amalgam fillings, alleging as his reason, that if they used the separators for amalgam fillings, when they took them off, the teeth came together again, and as the amalgam was crushed, they could not get perfect contact. He (Mr. Campion) thought there was always an interval of some hours before teeth, pushed apart by a separator, came into actual contact again. Mr. Campion concluded by thanking Mr. Minshall for having dealt so ably with a subject of every day practice. As a rule, they dealt too much in generalities, and did not enter sufficiently into details, either in their papers or their discussions.

Mr. MINSHALL, in reply, referred to one or two points which had been raised. In regard to Mr. Campion's remarks about cases in which the gums receded, even in those cases he (Mr. Minshall) had found benefit accrue to the patient by contouring the teeth. In reference to the crushing of the amalgam, after the use of the steel separators, he had not himself found that the teeth immediately resumed their natural positions, neither did the amalgam become immediately hard. But there was one point which seemed to be still of greater importance. One reason for objecting to the steel separator, and the teeth coming together quickly in these cases, arose from the fact that he found it necessary to slightly overfill the teeth, for the simple reason that he was not acquainted with any discs or wheels that would trim the amalgam filling and still leave it its original size.

On the motion of the President, a hearty vote of thanks was passed to Mr. Minshall for his paper.

Dental News.

DINNER TO THE PRESIDENT OF THE DENTAL BOARD OF VICTORIA.

Dr. Duncan Turner the President was entertained at dinner by the members of the Board, on Feb. 9th, and in proposing his health Dr. Springthorpe referred to the obligations the Board were under to Dr. Turner for the valuable help he had given at a time when it was most needed. In responding to the toast of "the Visitors," Mr. Shillinglaw stated that the library of the Pharmaceutical Society of Australasia now contained every British and foreign dental publication issued, and they were at all times available for reference.

The following are some of the questions set by the Dental Board of Examiners, Launceston, Tasmania.

Anatomy Paper, time 1 hour.

1. Describe the internal Carotid Artery.
2. Where is the spheno palatine ganglion situate, what nerves join it; trace the nerves coming from it to their termination.
3. Describe the sub-maxillary region after the removal of the superficial part of the sub-maxillary gland and the mylo-hyoid muscle.
4. What are the muscles attached to the eyeball, and what nerves supply them.

Physiology Paper. Time 1 hour.

1. State the number, names, and position in the mouth, of the temporary and permanent teeth. Describe minutely the structure of a tooth.
2. Give the structure and use of the salivary glands, their number and situation. What is the active principle of saliva, and what particular ingredient contained in food, does the saliva specially act upon?
3. Give the structure and use of the tongue, its nerve supply, and state upon what the sense of taste depends.
4. Describe the process of respiration. When breathing what do we take in and what do we give out.
5. Describe the course of the blood through the heart and lungs.

Dental Anatomy and Physiology Paper. Time 1 hour.

1. Describe the structure of enamel, cementum, and dentine separately, and their connection with each other in tooth formation.
2. State the number and describe the different movements of the jaws, and give the names of the muscles which produce them, with the blood and nerve supply.
3. What is the structure of the dental pulp, give its blood and nerve supply, also the structure of the periosteum, and its nerve and blood supply
4. Describe an odontoblast, and an osteoblast cell. Of what do they consist, and what are their functions?

5. Describe the process of tooth formation. At what period of intrauterine life is the first trace of dental development visible? State in what this trace consists.

In the General Anatomy and Physiology *viva voce* examination the candidates were questioned on :—

1. The names of the different bones of the body, and their articulations.
2. The names and position of the principal arteries, veins, and nerves.
3. The viscera of the head, chest, and abdomen.
4. The structure of the same.
5. The structure and properties of the principal tissues of the body.
6. The functions of digestion, absorption, circulation, respiration, secretion, motion and sensation.
7. The surgical anatomy and physiology of the organs of mastication, deglutition, taste, and articulation.

Royal College of Surgeons of England. The date of the next Examination of the Diploma of L.D.S. has been fixed for Monday, the 9th prox.

OBITUARY.

We regret to announce the death of Mr. Harry West Stoner, who, after forty years of active practice at Brighton, died at his residence there on March 23rd, 1892, aged 70 years. Although his name was well-known, he led a quiet, retiring life ; cardiac weakness, from which he suffered for some years, prevented him attending meetings or taking part in anything likely to cause excitement.

APPOINTMENTS.

Mr. Arnold Prager L.D.S., Eng., has been appointed House Surgeon to the National Dental Hospital. 149, Gt. Portland Street, W.

Ernest C. Davids has been appointed dental surgeon to Westbourne Provident Dispensary and Maternity and Hon. dental surgeon to St. Matthew's Home for female Orphans, Bayswater.

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PREVENTIVE DENTISTRY.

By William Rushton, L.D.S. Eng.

We have heard a great deal lately of Preventive Medicine, and as nobody denies the aphorism that "prevention is better than cure," we are likely to hear more of it still. I trust that the Institute of Preventive Medicine which seems to be coming into existence under such favourable auspices may be a tremendous power for good.

There are two prophecies current concerning the future of dentistry; one—the optimistic—holds that, in time, preventive dentistry (as contrasted with conservative dentistry of to-day) will successfully oppose the many adversaries which now attack the teeth; the other prophecy,—the pessimistic,—maintains that man will become a recruit to the ranks of the order Edentata, and that future generations will not only be toothless, but hairless and spectacled. In other words, they say that the dentistry of the future will be the perfection of mechanical appliances to edentulous mouths.

I think that the mean between these two extremes, comes nearest the truth, that the preventive treatment of the future will do much to prevent further deterioration of tooth tissue, but that teeth will never (in highly civilized communities) be brought back to the normal state as found in the skulls of our early forefathers.

Within the last thirty or forty years, there have been made advances in dental surgery and in mechanical appliances greater than those of all preceeding ages combined. And why? Because demand creates supply. We have suddenly become aware of the fact that our teeth are every generation more rapidly approaching the vanishing point, when "the grinders cease because they are few." The mechanician comes to the front and makes cunning devices, which every year are becoming more artistic. I do not think that we are at all near the end of our tether in this respect. I believe that the discovery of new methods and combination of materials, will tend to bring this branch of our art to still higher perfection.

But perfection in mechanical dentistry, though excellent as we all admit, is not enough. It is applying a palliative without taking thought of the cause of the disease.

The causes of the loss of the teeth, are, briefly, hereditary weakness, action of drugs and improper feeding, in a word, transmitted ignorance, which, of course, is most pronounced in the poorer classes. Why the teeth suffer more than any other part of the frame, (and by this suffering and loss, re-act upon the frame, and thus establish a vicious circle), is ably answered by Mr. Smith Turner, in the first part of his Presidential Address before the British Dental Association last year, and to which I must refer my readers. His statements and theories have not been contradicted, and I should imagine are incontrovertible.

I have said that the loss of teeth is due, fundamentally, to ignorance. Let us take an ordinary case of the poor, say in London, though from what I can learn, it would apply almost equally well to any of the smoke-begrimed, sun and air-starved masses of humanity in our large towns, the increase of which we are so proud of, when we take our Census.

An early marriage, (the ages of seventeen, eighteen, or nineteen, being quite common), of weakly subjects (often suffering from some hereditary taint), is followed by the birth of children, before the parents themselves have reached maturity. They are ignorant of the responsibilities they incur towards themselves, their future family and the State. Being ignorant also of the relative value of food stuffs, and equally ignorant of how to cook properly, the parents, although they may have enough to eat, are practically starved, and needless to say, the children which are born to them are not properly fed, either before or after birth. The effects of this ignorance are intensified with each generation, and thus we may readily believe the statement that the third generation of the Londoners is the last. Of course, fresh blood is continually being poured in from the already depleted rural districts.

In the more refined classes the conditions are better in many respects, but the bread we eat, made from the "best white flour" (in reality, the worst and poorest because the whitest) tannin-loaded tea, and the many unhealthy and artificial surroundings are bound to leave their mark. The "yoke of the butterflies" galls very surely; the tyranny of fashion and custom is enormous, fed on ignorance.

If it be true that ignorance is the main factor in tooth deterioration, it stands to reason that the only way to counteract this state of things is by increasing and applying suitable knowledge.

It would seem that much of the knowledge at present injected, at more or less high pressure, into children, profits them but little, while, as Mr. Smith Turner says, at the early period of life, the brain is a very active and powerful rival of the teeth, in the struggle for blood supply. There is a gigantic error abroad that intellectual training is "education." It is only " education " in proportion as the wants of the body are not overlooked in the culture of the mind. The mind is as much a part of the body as the eye and the hand, and when the balance is unequal, when the *mens sana* is not accompanied by the *in corpore sano* it is not " education."

It seems to me, that one of the lessons most wanted for children to learn is an elementary knowledge of, and respect for, their own bodies, with a knowledge of what wholesome food consists and knowledge of how to cook and dress the same.

When we learn that huge plates of pickles form the *piece de resistance* at the midday meal of our factory girls, and that lack of air and exercise, combined with tight lacing is producing in higher circles an increasing class of bloodless schoolgirls, we hardly know which ignorance to pity most.

The welfare of the State is the sum of the welfare of its individuals. The examiner and the payment-by-results man have had it too much their own way, and there are signs that a revulsion of feeling is bringing physical needs more to the front. We do not want record-breakers and elephant-lifters, but we do want an improved average of health.

There is no doubt that even to prevent teeth going any worse than they are at present, much must be done, and in the meantime the dental surgeon is coming more and more into requisition. The time is fast passing away when good dentistry is the privilege only of the wealthy, and ere long we shall be having dental surgeons appointed to all large institutions and the Services.

The recent work of Mr. D. Pedley and Mr. S. Spokes in the examination of the mouths of school children has served to give us some idea of the state of the mouths of children in a large charitable institution. Out of 903 children examined, the mouths of only 137, or 15 per cent. were healthy, and required no manipulation. This is the latest instance to hand of the work of destruction going on. Fillings, judicious extractions, and cleanliness are remedies, and should be employed to the utmost, but there is something more wanted, and that is the building up of young lives *ab initio*, so that sound tissues may be able to withstand the attacks of caries. This, of course, can only be done after many generations. The present state of things has not come about in a day, and assuredly will not be cured in a day.

It would be interesting (if it were possible) to have statistics of the condition of the teeth of the descendants of, say, some ill-fed, sun-starved Londoners who had emigrated, and whose children's children had been brought up under healthy and natural surroundings. I do not know if any data could be compiled, but I am afraid the descendants of the Pilgrim Fathers have as bad, or even worse, teeth than the descendants of our stay-at-home ancestors. This, I should think, is due to a more "rapid" life, and greater errors in diet than ours.

Is it Utopian to look forward to a much improved state of things? I think not. It rests with us to do our share in instructing the public, and in endeavouring to stave off the edentulous epoch of which the croakers tell us.

TUMOURS OF THE JAW, AND MICRO-ORGANISMS OF THE MOUTH.*

By Edmund W. Roughton, M.D. Lond., F.R.C.S. Eng.

The following subjects were dealt with :—

Ivory Exostosis of the Lower Jaw.

The specimen shown was about the size of half a walnut. It was composed of extremely dense, compact bone; through the centre of it there passed a canal, which in the recent state was occupied by the mental nerve. The microscopical structure of the tumour resembled somewhat that of compact bone, the Haversian systems, however, being very much more irregular in their arrangement. The section from which the photograph had been taken, was cut from a portion of the exostosis which had been decalcified.

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* A demonstration given at the Students' Society, National Dental Hospital.

The tumour had been removed from the lower jaw of a young woman. It occupied the position of the mental foramen on the left side. It had been growing some five or six years, and had recently caused some pain. Some little difficulty presented itself in the diagnosis, inasmuch as a tooth in the immediate neighbourhood of the growth was absent, and, according to the patient's account, had never been there. This led some, who had seen the case, to think that the swelling might possibly be a dentigerous cyst. However, the extreme hardness of the tumour, coupled with the fact that it seemed to grow from the surface of the jaw, and not from its interior, made the diagnosis of exostosis pretty evident. The treatment adopted was to saw the tumour off level with the jaw. It was pointed out that although this proceeding did not remove the whole growth, yet it was quite sufficient, as in these cases no recurrence took place.

MULTILOCULAR CYST OF THE LOWER JAW.

Several specimens of this disease preserved in spirit were handed round to illustrate the naked eye appearances presented by this very interesting tumour. All the specimens were from the lower jaw. The disease was very rarely encountered in the upper jaw, but when affecting that bone, most often occupied and distended the antrum. The jaws in the bottles shown to the Society, were seen to be distended by a number of cysts; in some of them the cysts were of large size, being capable of containing several drachms of fluid, whilst others were of almost microscopical dimensions. The walls of the larger ones were formed by bone lined by a sort of fibrous membrane; in the smaller cysts no bony covering was apparent. The minute structure of these tumours was then described with the aid of several micro-photographs projected on the screen. The cysts were seen to be formed by columns of epithelial cells forming acini, and closely resembling in their structure and arrangement, the enamel organ of a developing tooth; lining each cyst there was a row of more or less columnar epithelium, like the internal epithelium of the enamel organ.

The interior of the cyst was occupied by a number of stellate cells, which were stated to be epithilial cells undergoing a mucoid degeneration, like the stratum intermedium of the enamel organ. For the sake of comparison, a photograph of a section of developing tooth was also projected on the screen. With regard to the origin of these cysts, it was supposed that they were derived from aberrant portions of the enamel organ of fully formed teeth, or from that of supernumerary teeth which had disappeared, or that they were the representatives of teeth suppressed in the course of evolution. The credit of correctly describing the histological structure of of these tumours was due to Mr. Eve ; previous to the publication of his description these tumours were known as cystic sarcomata, a name which had probably been given to them on account of their naked eye appearance. Their structure was evidentally epithelial and not sarcomatous. The arrangement of the epithelium in these tumours was like that of an innocent epithelial tumour (adenoma), and not like that of a malignant tumour. The malignancy of the tumour depended not upon the epithelial element, but upon the structure of the inter-alveolar, or supporting connective tissue. Usually the latter was composed of fibrous tissue, and the tumour was a perfectly innocent one, growing very slowly, not affecting glands or distant parts, and not recurring after complete removal. Sometimes, however, the supporting connective tissue was more embryonic or sarcomatous in nature, in which case the tumour grew more rapidly, and showed more evidence of malignancy.

EPULIS.

This term was defined to mean any growth upon the gum ; it, therefore, included many different varieties of disease. As illustrating some of the more important varieties, the following specimens were projected on the screen.

1. *An inflammatory epulis.* The growth, which was of firm consistence, was removed from the upper jaw of a patient. The continued irritation of carious stumps and a badly fitting plate, had led to an inflammatory overgrowth of the tissues of the gum. The tumour was covered by healthy mucous membrane, and consisted entirely of fibrous tissue which had been formed from the inflammatory exudation. It was not a new growth in the ordinary sense of the term.

2. *A fibrous epulis.* This was from an epulis removed from a patient, in whom there was no source of irritation like

that present in the last case. It was of very small size, and had taken about 18 months to grow. It was composed entirely of fibrous tissue, closely resembling in structure the last specimen, but in this case being a true new growth. Such a tumour was entirely devoid of malignant characters.

3. *A fibrous epulis with admixture of sarcomatous elements.* This tumour had taken about the same time to grow as the last one had, but had attained a larger size, it was removed about 18 months ago and had recurred, necessitating a second operation. Histologically, it was composed of fibrous tissue, but interspersed amongst the fibres, there were a number of oval and spindle shaped cells. These were undoubtedly sarcomatous in nature, and although only of a low degree of malignancy, accounted for the tendency of the tumour to recur.

4. *A round-celled epulis.* This tumour had grown much more quickly and was of softer consistence. In structure, it was composed almost entirely of small round cells : there was scarcely any fully formed fibrous tissue in it ; showing that the new growth was almost entirely composed of embryonic tissue, and therefore, highly malignant. In the deeper parts of the section, particles of bone were scattered here and there, showing that the tumour had grown from the alveolar margin.

5. *A myeloid epulis.* This tumour was removed from a little girl 8 years old. It occupied the region of the temporary molar teeth on the left side of the lower jaw. It had been removed once before, but had recurred and grown somewhat rapidly. It was of a darker red colour than the gum, and somewhat soft to the touch. It was about the size of half a walnut when subjected to the second operation, when it was freely removed, a tooth on either side of the tumour being extracted, and the alveolar margin clipped away. Several photographs of this tumour were shown. The structure was that of a typical myeloid sarcoma, giant cells being present in vast numbers. The giant cells were seen to consist of an irregular mass of protoplasm, containing from 3 or 4, to 20 or 30 nuclei. They were usually enclosed in a distinct cyst-like cavity. Mr. Roughton was of opinion that these myeloid cells sometimes developed into capillary blood vessels ; this view he had first put forward in a paper he read before the Royal Medical and Chirurgical Society in 1889, and published in Vol. lxxiii of that Society's transactions, but this was the

first occasion on which he had been able to show the manner in which this took place. The process resembled very closely that seen in the large multinucleated cells in the vascular area of the chick, which had been described by Klein and others as developing into blood vessels ; first the giant cells became vacuolated and then branched, and containing round bodies like embryonic blood corpuscles. Precisely the same changes were demonstrated in sections of this tumour.

The next photograph shown, illustrated the manner in which large multinucleated cells, closely resembling those just described, are concerned in the destruction of bone. The section shown, was from a myeloid sarcoma, in which there were many fragments of bone, which were seen to be hollowed out into little concavities (Howship's lacunæ) by these large cells (osteoclasts).

ROUND-CELLED SARCOMA OF HARD PALATE.

The notes of the case from which this specimen was removed are to be found in the Odontological Transactions for March, 1892. Mr. Roughton then proceeded to show photographs of some of the commoner micro-organisms of the mouth.

The first four specimens were micro-organisms from the soft deposit found on the necks of teeth which have not been cleaned. The preparation from which the photographs had been taken, had been made in the following manner. A small portion of soft white deposit was scraped off a tooth which had not been cleaned for 24 hours : this was smeared upon a cover-glass in a very thin layer, stained in gentian violet and mounted in water. Such preparations showed that this white deposit was composed almost entirely of micro-organisms in great variety ; the majority of them were rod shaped (bacilli), and varied greatly in size and form, some being long and slender, some shorter and thicker, some singly, others in jointed chains ; there were also numerous round bodies (micrococci) some in clusters (staphylococci), and some in pairs (diplococci) : scattered here and there were a few screw shaped organisms (spirilli). These specimens showed how important it was to clean the teeth thoroughly and antiseptically, in order to avoid dental caries.

The next photograph had been taken from a cover glass preparation of a gelatine culture inoculated from a case of catarrhal stomatitis. The germs in this case were comparatively large round bodies which had been described by authors as micrococci, to distinguish them from the smaller micrococci; they were arranged in very regular groups like piles of cannon balls.

The next photograph was from a cover-glass preparation of phthisical sputum. It showed small beaded rods, singly and in clusters, among the pus cells of the expectoration, these germs (tubercle bacilli) although found in the mouth, were of course derived in the first instance from the lungs. From the same cover-glass preparation a photograph of a squamous epithelial cell of the mouth was shown; on it was a long chain of short bacilli. These were very commonly seen in decomposing sputa, and it was suggested that these germs fed in part upon dead cast-oft epithelial scales of the mouth.

The next specimen was of more direct interest to the dental practitioner. The photograph had been taken from a cover-glass preparation of a gelatine tube, inoculated from the pus in a typical case of pyorrhœa alveolaris (so-called Riggs' disease). The photograph projected on the screen showed various forms of micrococci, chiefly staphylococci, and streptococci. These organisms were frequently found associated with progenic processes in various parts of the body, and were not in any way peculiar to cases of Rigg's disease. When Mr. Roughton first saw this patient he felt convinced that the disease was a purely local one, and due to the action of micro-organisms; acting on this assumption he advised the local application of perchloride of mercury. This was done regularly, twice a day, for about two months, by soaking a wisp of cotton-wool in a 1 in 1,000 solution of perchloride, and pressing it down between the gum and the tooth, wherever the suppuration was detected: this was attended with the best results, the suppuration ceased, and the teeth tightened up a good deal. They did not, however, become quite firm, as the alveolar margin had already become absorbed, to a certain extent, thereby shortening the sockets of the teeth. The only objection to this method of treatment was that the mercury becoming deposited on the necks of the teeth, produced a black stain, but this was easily removed by friction.

THE TEETH OF SCHOOL CHILDREN.

Mr. Rushton draws attention, in his communication on Preventive Dentistry," to the small percentage of children, in a large parochial school, who do not require dental treatment. In this particular instance the authorities have determined to appoint a qualified dental surgeon, but in another large school, which was examined in a similar manner, the same happy result has not yet been attained, although the need of such an appointment is urgent. The report which was furnished has not been published, but we are enabled to make the following extracts from that part which refers to a table showing some of the results of an examination of the mouths of 257 boys and girls with an average age of 10¼ years :—

1. " With regard to the *Temporary Dentition.* It is "popularly believed that these teeth are not deserving of any particular attention, as in the natural course of events they must disappear to give place to the others of the permanent set. Whilst there may be some ground for this view, it is nevertheless true, that much misery to children, as well as detriment to health, is avoided by intelligent watching and treating of temporary teeth. This is not the place to set forth arguments upon this question, and we can only call your attention to the fact that, in our opinion 212 temporary teeth occurring in children between the ages of 4 and 11, inclusive, require filling ; whilst 243 others, or the remains of them, either from being too badly decayed, or from being unduly retained (to the detriment of their successors) beyond the normal period, should be removed. The total of temporary teeth requiring attention is 459.

2. *Permanent Dentition.* Between 6 and 7 years of age the first teeth of the permanent set may be expected to make their appearance. From their presence in the mouth along with the temporary, they are, unfortunately, too often regarded as belonging to them, and thus their decay and loss are ignored, to the great injury of a complete dentition. Instead of being the last teeth of the temporary set it should be borne in mind that the 6-year old molars are the first of the permanent set—most important teeth, not only from size and masticating function, but also on account of the position they hold in the jaw and in the series of teeth making up a full set. It is worth while, then, to pay the greatest attention to these individual teeth. After their eruption the temporary

teeth are gradually replaced by the corresponding members of the permanent set, and at 12 years, and not until then, the second molars may be expected. It is, therefore, important that, at all events up to that age or period, the 6-year old molars should be kept in good working order as presenting the only masticating surface which is continuous during the change which is taking place between the temporary and permanent teeth. Referring to the table it will be seen that between the ages of six and twelve, inclusive, there are 257 permanent teeth which can and should be saved. More than 200 (over four-fifths) of these are 6-year old (or first permanent) molars. After the twelfth year the proportion of permanent teeth demanding attention suddenly rises for the next two years, and even in the subsequent year the ratio of teeth which should be filled, in order to be saved, appears to be still increasing.

3. With regard to cases in which the teeth assume irregular positions (an occurrence which is recognised as one of the predisposing causes of caries) the total is put down at 29, in which it would be right to take steps to remedy the condition either by extraction of certain teeth, or by the application of some mechanical apparatus. But there are several other cases in which the teeth are crowded and require subsequent inspection.

4. Under the heading *Sound Dentitions* are enumerated those cases in which there was an absence of diseased teeth. Many of these were passing through the transition period between the first and second dentitions. Some children required merely the easy extraction of temporary teeth to place them in a satisfactory state, but it is nevertheless a fact which merits careful consideration, that out of 257 children's mouths inspected, only 43 presented which required neither fillings nor extractions, and that in all the others some condition exists which necessitates special attention in order to procure, as nearly as is possible, a healthy mouth. With regard to the general condition of the mouths of the children we were obliged to describe some as "foul" or "very foul." These were few in number, but (besides other cases in which tartar was noted as being present) there were 56 cases (over 21 per cent.) described as having "dirty" mouths."

It will thus be seen that only about 16 per cent. of the children examined did not require dental treatment.

British Journal of Dental Science.

LONDON, MAY 2nd, 1892.

THE PRESS AND ADVERTISING.

As might have been expected, the recent decision in the Court of Appeal, and especially the terms in which the judgment was delivered, gave rise to a widely spread ebullition of feeling on the part of the Press, and, as many of our readers will not have had the opportunity of such an extensive view as ourselves, and as there is some interest attaching to the matter, we propose to allude to some of the points noticed. Most of us, no doubt, were prepared to find what view would be taken by newspapers with regard to the propriety of advertising, and, in addition, are ready to make allowance for statements faulty for the want of such knowledge, upon special details, as alone would enable a proper opinion to be formed. But, while some of the remarks which frothed most fiercely to the surface were not nice reading, yet taken as a whole, there are redeeming points in the collective criticism which enable one to regard it with more equanimity than, at first sight, might be expected.

Some of the writers, of course, overlook the fact that the General Medical Council has not, as yet, decided to remove from the Register the names of all those dentists who advertise, whilst others, again, labour hard to show that there is a good deal of private advertising. One large Daily which some time ago assisted in the attempt to set geographical limits to modes of practice, and helped to boom "American" dentistry, had a long article which scarcely alluded to the dental aspect, but dealt, more or less humourously, with a suppositious condition of legal advertising. Other articles, however, kept more closely to the business in hand, the two main arguments apparently being that the system of advertising, whether by newspapers or otherwise, is universal; and, also, that it is for the public benefit. Thus, one paper admits that the theory underlying the ideal of the Master of the Rolls is a good one, but claims that it is not the self-advertisement that is wrong, but the mode of it. Another does not attempt to defend the appellant, but thinks the objection to advertising savours rather of an ancient and obsolete ordinance, and that, as the practice is so universal now, it seems ridiculous to debar any man from availing himself of an advantage to be gained from the investment of money in this direction. From the public benefit point of view, a third asks why a man should be driven to decide merit from a contemplation of brass plates when he might learn so much more from the advertisements; whilst a London weekly puts the legal maxim of *caveat emptor* forward in the most light-hearted manner. "If it be said that only incompetent dentists advertise, what of it? Let the public judge. They will soon shun the advertising practitioner if they find he is a fraud." In other words, let the individual buyer run his own risk.

If one endeavours to look a little below the surface an explanation may possibly be found for such a consensus of opinion, for without imputing unworthy motives we think we can see the true sense in which advertisements may be for the public benefit. Most of us know that a regular supply of well-paying advertisements is as the breath of life to publications associated in the keen competition which now prevails, and if it may be supposed that by such means the public does benefit, by receiving a supply of that news, which it so dearly loves, at as low a price as possible, then it must be remembered that we are not disposed to ask that all other advertisements should be suppressed, but only that we are willing to agree with the *Lancet*, "a diploma is the honourable alternative of advertisement. It is the *testamur* of judges as distinguished from personal boasting, in which no real value resides."

Amongst all that has been written, it is consoling to notice that the advances which have been made in the Science and Art of Dental Surgery have not been overlooked. Many quotations might be made proving that the recent case has led to a recognition that the modes of practice and the status of the dental surgeon are on a higher level than has hitherto been attained.

Another result has been the appearance of letters in the correspondence columns, and, apart from the amusement afforded by the high tone taken by some in favour of advertising, we may congratulate ourselves that the practical outcome is favourable. The *Times* gave very full space for the prompt publication of an opportune letter from the Dean of the London Dental Hospital, written in his official capacity, and covering the ground in as condensed a manner as was compatible with clearness, and this was itself compensatory for any annoyance caused by irresponsible effusions.

STAPHYLORAPHY.—In estimating the advantages of mechanical treatment of cleft palate as against the operation of staphyloraphy, it is usual to allude to the risks of the latter operation, although, perhaps, without much stress. On the 23rd ult., a boy of six, deformed, and somewhat delicate, was chloroformed by an expert with his usual care, and the operation of staphyloraphy was successfully performed. The head was placed in the fully extended posture, The breathing became indistinct just as the operation was completed and the heart failed. Artificial respiration was kept up for an hour, but failed to resuscitate the patient. Even in some of the most successful cases it is found that the tightly stretched velum leaves something to be desired with regard to distinctness of articulation. A great drawback to the mechanical treatment, consists, of course, in the fact that the patient is dependent upon his dental surgeon for fresh plates, and that the demand, as pointed out by Salter, may arise under inconvenient circumstances.

New Physiology of Digestion.—We publish elsewhere an abstract from a paper which condemns the extraction of teeth. It is possible that, with the idea of strengthening the position he took up, the author was anxious to work in a little physiology, but we cannot accept the suggestions he makes. It is against all known observations to say that a morsel of meat, saturated with normal saliva, is almost digested without the action of the stomach upon it. If there is one elementary fact in physiology, which the youngest student remembers more than another, it is that the saliva has only one chemical action upon food, namely, the conversion of starch into some kind of sugar. Even if there remain some non-peptonised proteid after the gastric digestion, it is upon the trypsin of the pancreatic juice, and not upon the amylopsin (which cannot be distinguished from the ptyalin of saliva) that one depends, for the conversion of the proteid into peptone.

Again, the author states that, where artificial teeth are worn, the stomach is compelled to perform mastication, but he apparently forgot to recommend the addition of a little gravel, to assist in this gizzard-like arrangement. It is stated that the author is proud of his paper, and agrees with an opinion expressed, that it is the best he ever read. However, if he will explain the little difficulties mentioned above, we shall be more ready to consider gravely the other opinions he holds.

Restoration from Chloroform Syncope.—To carry out a new method of attempting to overcome syncope produced by chloroform, the anæsthetist stands on the left side of the patient, facing his head. The left hand grasps the right side of the chest, whilst the right hand compresses the precordium with rapid and forcible movements at the rate of 120 or more a minute. The effect is estimated by the carotid pulse thus produced and by the contraction of the pupil. The mouth and air passages must be kept free by another person. A pause may be made when the pupils remain small and there are spontaneous efforts at respiration. Two cases are given in the epitome of the *British Medical Journal*, both of which, according to previous experience, would have been regarded as lost. In the first, the patient began to revive in an hour, and in the second, in an hour and ten minutes.

OSTEOBLASTS AND OSTEOCLASTS.—Those students (and are we not all, always students?) who are interested in the points connected with absorption and exostosis of roots, and the alternative processes of absorption and calcification in temporary teeth, will be interested in reading the suggestive remarks, on osteoblasts and osteoclasts, made by Prof. Cleland in his paper on Corpuscular Action. It should be remembered that the author prefers the term "corpuscle" to "cell."

THE EUSTACHIAN TUBE.—Students are taught that during deglutition the mouth of the tube opens, and, that thus, air is admitted into the cavity of the tympanum. It seems that this point has been disputed, and Professor Politzer, the distinguished aurist of Vienna, recently drew attention at a demonstration he gave at Sir W. Dalby's, to an experiment which appears to prove that the mouths of the Eustachian tubes *are* normally dilated during the act of swallowing. If the ends of the branches of the tuning fork C^2 (with 512 vibrations per second) are held in front of the nostrils of a person with normal hearing, the sound becomes much louder when swallowing is performed, and the Professor suggests that this fact may be useful not only in diagnosing obstruction of the tube in disease of the middle ear, but also in estimating the amount of improvement during treatment.

DO WE LIVE TOO FAST?—Dr. Cyrus Edson, the chief inspector of the New York Board of Health, discusses this question in the pages of the *North American Review* for March. He corroborates the opinion which is generally held that, in the main, the American strives for wealth as the greatest reward in Life. They are able to succeed in this struggle in consequence of the free competition which prevails, combined with the existing social environments, but these factors cause the race to be run at a tremendous pace. "The American works harder than does any other man or woman on earth." Dr. Edson draws a graphic picture, from a medical aspect, of the results which ensue to the individual organism in consequence of this wear and tear. A large quantity of rich food and alcoholic stimulant is taken as fuel, and then one of three terminations may be expected; either the individual becomes an inebriate, or so impairs his digestive organs as to burn out, or his excretory apparatus is overburdened with work,—Neurasthenia is the result. So far as women are concerned, the author is of opinion that the American mode of life tells far more upon them than it does even upon the men; they have less exercise, are more highly strung, and they are intensely affected by the strain. As might be expected when we leave the individual, and come to the race, the picture becomes still more gloomy. The offspring are even more nervous but they also seem to inherit the determination to race towards the same goal. "Their abilities are more keenly practical and their ambitions higher." Dr. Edson does not believe the strain can be relaxed, and, therefore, the only advice he can offer is to build up the body, the better to fit the organism to sustain the excessive use of the brain. "The American race has run too much to brain," and he, therefore, strongly recommends the development of the muscles by physical exercises.

NATIONAL HEALTH SOCIETY.—At the general meeting recently held, the report showed the important national character of the Society's work. It has been sending competent teachers throughout the country to deliver courses of "homely talks" to the working classes on nursing, cookery and health. It is satisfactory to find that seven different counties applied to have this instruction given to the poor, and the County Councils have, in our opinion, few more important duties than to arrange for an extension of the spread of such useful knowledge. It is the poor who suffer the most from ignorance upon matters affecting the health; the classes above them can more easily afford to waste food by bad cooking, and if they ignore the laws of health, it does not affect the family circle to the same extent as in the case of the labourer's little household. Those who have had opportunities of observation, know that there is here immense scope for missionary work in the best sense, and that, speaking generally, the poor will be the first to recognise the benefits resulting from instruction when offered them in a practical manner, and in a way that can easily be understood. We do not know precisely what arrangements are made for imparting information about the teeth, but as Mr. Rushton forcibly points out in his paper on Preventive Dentistry, in this number of the *Journal*, ignorance is an important factor in the production of the present unsatisfactory state of things. The courses of lectures given by the Society generally comprise a tour of twelve weeks consecutively, with an average of ten lectures a week, and the county lecturers have been trained principally by the Society. No doubt the care of the teeth is alluded to in the lectures upon personal health, but the matter is far too important to be dismissed with a casual reference, and we should be glad to find it made the subject of a special "homely talk," even if it were found necessary to invite a specialist to give it.

DENTAL SURGERY IN THE NAVY.—Those who remember the story of the pickle bottles, filled by the sick-berth steward with extracted teeth, will learn with interest that, at last, a better state of things is now to be inaugurated. From the fact that the Navy is generally considered the more conservative of the Services, it may be hoped that the Army may also see its way clear to follow an excellent example. Surgeon Herbert Canton has been appointed to the *Victory* for Haslar Hospital from May 16th, for the purpose of giving a short course of lectures in dentistry to surgeons passing through the course at the hospital, and to otherwise educate them in the simpler operations of dentistry. He will also perform all the dental operations required at the hospital, and on board the *St. Vincent*, and in the interval between the two courses of instruction, visit the *Boscawen* at Portland periodically, and,if possible,the Marine Division at Chatham, and the Marine Depôt at Walmer. Surgeon Counter was formerly a student of the London Dental Hospital, and has kept himself well posted in the latest methods of practice.

THE DENTIST'S ACT.—*Dexter*, writes to ask the *Chemist and Druggist*, whether he can put upon his labels "teeth extracted, scaled, and stopped," without running any risk. The reply is that it would not be an infringement of the Dentist's Act for an unregistered person to make such an announcement.—Whilst this may be so, we should like to know whether Dexter could legally answer "yes" if he were asked whether he was a stopper of teeth—Acts of Parliament and Laws leave much in doubt, but sometimes the point will have to be settled as to whether such an answer would constitute the use of a title implying the person, was a dentist.

Abstracts of British & Foreign Journals.

CERTAIN ASPECTS OF CORPUSCULAR ACTION.

By Prof. JOHN CLELAND, M.D., F.R.S.

The author regards it as a generalisation from which there is no escape, that every mass of living protoplasm exists in two conditions, of which the extremes are—one, activity of irritability with rest from nutrition; the other, quiescence of irritability and activity of nutrition; and this, in the case of such specialised tissues as muscle, nerve, and secreting glands, means that the work done for the economy is in abeyance during the nutrition of the corpuscle, while conversely the corpuscular nutrition is in abeyance when work for the economy is done. The author gives instances to support his contention, and points out that the practical lesson is obvious—when repair of corpuscular structure is wanted, nervous excitation is to be avoided.

Even, however, if this mutual antagonism be accepted, there seems to be much to settle between the two extremes. What is the relation of proliferation to the irritated state? Reproduction is, no doubt, in the general, a form of nutrition, but it is not plain that the conditions which favour the maintenance and enlargement of one corpuscle are identical with those which encourage it to break up into several. Indeed, they are not identical, as may be seen from the more specialised elements losing reproductive power, and to exemplify this contention, reference is made to the muscular fibres of the pregnant uterus and in fatty degeneration, and also to nerve fibres and corpuscles. Thus the highest form of corpuscular life may be held to be incompatible with reproduction.

But reproduction is not the only thing which complicates the nutrition of corpuscles. The living corpuscles are the centres of many changes, which do not necessarily, so far as we know, affect their own intimate composition. These may be described as absorptive and secretory. There is absorption from the outside, as by intestinal epithelial cells, and that within the body, whether of living tissue, foreign body, or tissue which has died and become practically foreign to the economy. Secretory actions are also of more than one variety for they are not necessarily under the influence of nervous stimulus, like the secretion of saliva and gastric juice. There is also a great deal of secreting action carried on by corpuscles in the form of deposit of matrix, which is certainly independent of the nervous system.

The author points out that it would greatly simplify ideas with regard to absorptive and secretory actions, if it were recognised that they are fundamentally actions of the same description, with the one distinction that, in absorption, substance is drawn through the corpuscle, to fall, in the long run, but never immediately into the blood ; while in secretion, substance is drawn by the corpuscle from the blood, to be poured out on a free surface, or to be deposited in the tissues. The direction of the current is the sole difference, and both one and the other may occur with or without chemical change.

In absorption of solids in the tissues, it is difficult to determine to what extent the substance taken up aids the life of the corpuscle, and the absorptive action is associated with such changes as growth and proliferation of the corpuscle itself; and it remains to be determined what degree of irritation, if any, is most favourable to absorption of matrix. It appears likely that in secretory action or throwing out of substances, there is quite as much variation of the relation to corpuscular nutrition. While in secretion under the influence of nervous stimulation there may be actual abeyance of nutrition, the deposit of matrix of connective tissue, cartilage, and bone seem to be carried on in conjunction with corpuscular growth and proliferation ; and it remains to be determined what are the degrees of irritation most favourable to deposit of matrix ; and also of the different kinds of matrix, although it is evident, at the outset, that the kind of matrix depends on some other factor besides the mere amount of irritation. An interesting and suggestive description of the formation of bone follows, and then the author deals with the later changes in bone which seem to exhibit a similar sequence of processes. That is to say, they are inexplicable on the supposition of different kinds of corpuscles being set apart for different purposes, as leucocytes, marrow cells, osteoblasts, and osteoclasts. They are to be taken as exhibiting different absorbing and secreting actions of the same families of corpuscles in different circumstances. Absorption of bone-matrix may begin either from underneath the periosteum, or at the wall of a medullary space, or by enlargement of a Haversian canal; and perhaps, most frequently of all, it begins in connection with a lacuna. In an excited activity of nutrition, a single bone-corpuscle enlarges, and may proliferate producing a protoplasmic mass with a number of nuclei within a ragged space, larger than the original lacuna, but hemming in the corpuscle sufficiently to prevent the protoplasm separating into masses surrounding the nuclei one by one. At least, such is the appearance, and this explanation of the phenomena by the action of pressure may be applicable to the giant-cells, osteoclasts or myeloplaxes, wherever found in bones. The author has no hesitation in believing that the multinucleated corpuscles found in limited spaces fall asunder when the spaces become larger, to become, in turn, osteoblasts, connective-tissue-corpuscles, or marrow-cells, according as in the struggle for existence they are exposed to different immediate surroundings.

The paper deals with other very interesting points.

Glasgow Medical Journal.

RUBBER AND THE PROCESS OF VULCANIZING.

By Dr. W. C. Barrett.

The dried product of the rubber tree consists of caoutchouc, with a little albumen and nitrogenous matter, and unless the former is freed from the two latter ingredients the quality of rubber gum may be injured by their decomposition. The caoutchouc is held in suspension in the watery fluid, that exudes from the tree, by ammonia, and so forms a vegetable emulsion; when exposed to air the ammonia is given off, the caoutchouc coagulates and the water evaporates, whilst the other ingredients are held within the inspissated mass. Coagulation may also be induced by the addition of an acid, or a saline fluid, alum or salt water being commonly employed. If ammonia be added to it, coagulation is prevented. If salt water be added, the gum is injured by being made very hygroscopic, or capable of absorbing a considerable quantity of water.

Pure caoutchouc is a hydro-carbon, it being composed of carbon and hydrogen exclusively, in about the proportions of 87·5 per cent. of the former, to 12·5 per cent. of the latter. It possesses peculiar properties, among these being extreme elasticity, and great tenacity. It is insoluble in water, alcohol, alkalies and acids, with the exception of concentrated nitric, and sulphuric acids, but is soluble in the ethers, chloroform, and best of all in bi-sulphide of carbon. When pure it is colourless, with a semi-transparent appearance. The tree that produces the gum, grows in nearly all tropical countries, but the quality varies materially with the locality, not only in the amount of foreign material which it contains, but in the nature of the caoutchouc itself. The best quality is the product of trees which grow in the provinces of Para and Ceara, in the northern portions of Brazil. Not only is this gum purer and stronger, but it is usually better cured than that produced in many localities.

There are various methods of mixing the sulphur with the rubber. It is not sufficient that the two be merely brought together. The sulphur must be in actual combination with the rubber. If a sheet of pure rubber be immersed for a few moments in a bath of melted sulphur, it absorbs about one-third of its weight, but although its colour is changed somewhat, it is yet unaltered in its characteristics, because the two are not yet chemically united. But, if it now be subjected to a sufficiently high temperature, combination sets in, and the result is what is known as vulcanized rubber. If the melted sulphur bath be at a temperature of 320° F., the absorption and incorporation occur simultaneously. Vulcanization of rubber, therefore, is not the application of heat, but the combining with sulphur, which does not take place at ordinary temperatures.

A temperature of 320° is not necessary for the vulcanization of rubber. In fact, if it be raised to this point, the character of the product is materially injured. If the sulphur be thoroughly mixed with the gum, and the whole be subjected to a temperature as low as 240° F. for a sufficient time, it becomes vulcanized and will be more elastic than if vulcanized for a shorter period at a higher temperature. Any point above the melting point of the pure gum is sufficient, if enough time be allowed for the combination to be perfected.

If a larger proportion of sulphur be mixed with the rubber, and the vulcanizing process be done at a high temperature, or be long continued, the character of the product is materially changed, and hard rubber, or ebonite, is the result. About 40 per cent. of sulphur is ordinarily used for this purpose. A cheaper kind of rubber is commonly employed, or it is "loaded" by mixing with it a considerable quantity of some earthy material. The prepared gum is coloured by incorporating sufficient whiting or lampblack. Dental rubbers are coloured by vermilion.

Rubber may be made porous when vulcanized, if there be incorporated in the gum any substance that gives off a gas at the vulcanizing temperature. Porosity is always the effect of some decomposition within the substance of the mass when vulcanizing. Thus, if alum shall have been used in coagulating the juice of the tree, and it shall not have been entirely removed, the result will be a porous rubber when vulcanized. Carbonate of ammonia will produce the same effect, as will small particles of wood, or other decomposable material. It is possible, too, that rubber which is hygroscopic through having been precipitated by salt, may contain sufficient moisture to make it porous when the mass is raised above the boiling point of water. If the temperature be suddenly raised to a high point, the rubber may become fixed and vulcanized in a porous condition, when if more time were allowed the vapors might escape, and if the prepared gum were under pressure it might become solid. The sponginess is not due to any changed condition of the rubber itself, but to the presence of a distending gas. Any uncombined sulphur is injurious, but an excess of sulphur is desirable to insure perfect vulcanization. It should be removed from the finished product by a solution of caustic soda, or some other solvent.

The Dental Practitioner

PERUVA DENTITINE.

Precipitated chalk	1 oz.	Powdered cassia	¼ dr.
Powdered cuttle-bone	½ ,,	,, camphor	¼ ,,
Red cinchona-bark	1 dr.	Oil of lavender	5 minims
White Castile soap	1 ,,	,, sassafras	5 ,,

Mix.

CASE OF EMPYEMA OF THE ANTRUM OF HIGHMORE, WITH OZÆNA.

By Dr. Hunter Mackenzie.

A female patient, aged 23, had suffered for over a year from an offensive purulent discharge from the right nostril. Dry crusts came in the morning, and recent pus at other times. She had no complaint beyond bad teeth. When the patient was placed on a couch with the affected nostril and antrum uppermost, and the head bent slightly downwards over the edge, pus dropped freely from the affected nostril. The same occurred in the sitting posture, with the head slightly forward. There was no pain, tenderness nor swelling, over the right cheek; but frontal headache, usually confined to the right side, was almost constantly present. Electric illumination showed the right antrum to be slightly less translucent than the left, but control electric observations in other cases without antral affections showed somewhat similar inequalities. An offensive odour was present. The upper teeth were much decayed on both sides; and three stumps were removed, the antrum opened through the situation of the first molar, its cavity thoroughly curetted and then a warm alkaline, and afterwards a boric acid solution was used to wash out. No tube was inserted, but the opening was plugged with carded cotton and kept patent for about ten days, irrigation, followed by insuftlations of powdered boric acid, being employed. The discharge of recent pus ceased, but the dry offensive crusts, already referred to, continued to form and be discharged daily. This ozæna was treated by a method, instituted by Dr. Mackenzie, which consists in persistently irritating the affected portion of the mucous membrane by repeated applications of blistering fluid and "canthos cotton." Under this treatment the chronic condition of ozæna was superseded by an acute inflammation with a copious watery discharge, which ended in recovery.

Remarks.—This case is an interesting example of what is rarely met with, the coincidence of empyema of the antrum and ozæna. These diseases, though sometimes confounded, are essentially different in their nature, symptoms, diagnosis, and treatment. In empyema, the pus is always fluid, and not formed in the nose although discharged through it. The most usual factor is decayed teeth. Fœtor, varying in intensity, is frequently, but not always, present. Electric illumination and comparison of the two antra cannot be relied on, as in their normal condition these vary greatly in capacity, thickness of walls, and in the number and size of the septa in their interior. A good sized opening should be made, and it is of some interest to know that pus may not at once be discharged through the perforation, or until a few hours have elapsed. An important point which greatly hastens recovery is to thoroughly curette or scrape the cavity before the patient has emerged from the anæsthetic. Dr. Mackenzie objects to a tube in the perforation unless the pus is excessive and very fœtid. But in whatever way the perforation is plugged, care should always be taken to prevent the passage of food or other substances. A case was seen some time ago in Edinburgh, which obstinately resisted all treatment. Perforation had been performed about a year previously, by a dental surgeon in England, who had omitted to give the patient directions in regard to plugging, and of his own accord, the latter had tried to fit a wooden peg into the opening but it had slipped into the cavity and was extracted with beneficial results.

With regard to ozæna, the pus is formed in the nose but discharged in the form of dry hard crusts, which have the odour characteristic of the disease. As for treatment, the mechanical removal of the crusts by means of a nasal probe, headed with carded cotton saturated with a warm alkaline solution is the first step, and then simple continuous irritation, as described above, has given Dr. Mackenzie the best results. Sprays and douches are perfectly useless as they leave the crusts adherent.

British Medical Journal.

ANTI-EXTRACTION.

By W. N. Morrison, D.D.S.

The paper sets forth the most extreme views with regard to the retention in the mouth of the natural teeth, and the author states that for years he has only extracted teeth, or roots, when they were so loose that they could be removed with the finger and thumb. He wishes every other member of the profession would adopt that rule. There should be no artificial dentures made by the future dentist. Consider for the moment thirty-two natural teeth, in normal jaws, capable of being brought together with a pressure of four hundred pounds to the square inch upon a morsel of meat (tough Texas); then the involuntary swallowing of the juice, leaving the solid fibres dry and empty to absorb the secretion like a sponge from the glands, whose ducts open at that part of the mouth. The morsel so saturated with normal saliva is almost digested without the action of the stomach upon it—such persons rarely realize that they have a stomach. Mastication, in the true sense, cannot be performed with artificial teeth. Little squares of meat are rolled around in the mouth, and may have a few holes punched into them, but are sent nearly whole into the stomach, thus compelling that organ to perform two offices, that of mastication, as well as that of digestion. This is a subject the public have entirely overlooked, and the author charges the dentists with apathy also. With regard to the deciduous teeth. If they are carefully cleansed and kept from decay, they will drop in their proper time, as do the leaves in autumn. When the pulps are dead, and the crowns occlude against their opposing fellows, the author snaps the crowns off with excising forceps, and keeps the roots ground down, but leaves them in the alveolus as wedges, which increase the arch. Finally, in his paper, he calls upon the strong arm of the Law for a remedy, and would make it punishable by fine for any one to extract a firm tooth or root.

American Journal of Dental Science.

CITROLEINE DENTIFRICE.

Precipitated chalk ...	1 lb.	Cuttle-fish bone	2 oz.
Powdered sugar	2 oz.	Bicarbonate of soda ...	2 ,,
,, orris	4 ,,	Oil of lemon	2 drs.

First tint the precipitated chalk with a concentrated tincture of saffron and then spread on paper to dry. Then take the soft portion of the fish-bone, which can be scraped off with a knife, place in a mortar with the sugar, rub well down to a fine powder. To this gradually add the powdered orris-root, bicarbonate of soda, and oil of lemon. Mix thoroughly, then gradually incorporate with the chalk by working in a mortar or mixer or sifter.

DENTISTRY IN DENMARK.

By V. Haderup.

Dentistry was always considered in Danish legislation as a specialty of the general healing art. Consequently its practice was at first, as a rule, only open to qualified medical men; but the development of circumstances in this field has brought about a change, which has made the exception now, what was formerly the rule. Already at the end of the last century, the increase in the use of artificial teeth made it appear desirable to have dentists, who have been principally trained in the prothetic branch of dentistry; a "tentamen" in the special parts of medical science for non-graduates in medicine established at the Surgical Academy in 1796, and discontinued only in 1873, gradually became almost exclusively an examination for candidates in dentistry; while qualified medical men, practising dentistry, have in the latter half of our century become a steadily decreasing fraction of the total number of dentists.

The organization of dentistry up to the present day has rested essentially upon administrative Decisions, and Rules devolving therefrom, the starting point of which was given in the Quackery Act of September 5th 1794, § 6 of which reads thus: "If any one, without being a qualified practitioner, has acquired excellent knowledge and peculiar skill in some special branch of medical art or in curing some disease, he may be granted a license to practise from the Board of Justice and Home Department, if he is able to prove himself possessed of those faculties by testimonials from the County Governor (*Amtmand*) and Superintending Medical Officer (*Physicus*), only however in the district, in which he resides, and provided that his right to prescribe medicines be limited to those branches in which he has proved his skill." Legislation having taken no further steps in these matters, this Act continues to form the base for the issuing of licenses to practise dentistry to others than qualified practitioners. The Ministry of Justice (from 1849 the successor to the Board of Justice and Home Department) persists in claiming, that according to legislation now in force, the fulfilling of certain conditions does not open the admission to dental practice as a right, free to all, but that a particular license to practise is required in every instance and granted only with local limitation.

From the point of view, that only as many candidates ought to be admitted to the examination for dentists, as could expect to get a license to practise, according to the demand existing, permission to present oneself for examination has been up to 1873 dependent on the consent of the Board, later the Ministry, of Justice. Since then, according to Royal Act of February 19th, a regular *examination for dentists* was established, admission to which was the General Preliminary Examination. While formerly certificates were only required to prove a certain degree of general education and technical skill, the Regulation of 1873 introduced a so-called test in mechanical technics,viz. the making and inserting of artificial teeth, which had to be passed, before the candidate was admitted to the final dental examination.

By Royal Act of June 19th, 1888, a clinical test was added to this examination, which had up to then been essentially theoretical only, and under the Ministry for Educational Matters as supreme administration a *dental school and infirmary* was established, which imparts the guidance in the theoretical instruction and clinical training required for the dental examination. The school has a President, who must be one of the lecturers on surgery of the medical Faculty of the University, and 2 teachers, one for the clinical subjects, one for the theoretical, of whom the former must be a dentist practising in Copenhagen, while the latter must be a graduate of the medical school of the University. Those, who desire admittance to the school must have passed the General Preliminary Examination, (according to Royal Act of August 30th, 1881), but must also be accepted as pupils with a dentist, practising in Denmark. The requirements for admission to the technical test are : at least one year's attendance at the courses of the school, and at least 2 years' work as a pupil under one or more dentists practising in Denmark ; to present himself for final graduation the candidate must have completed his 21st year, must have passed the technical examination, and taken a full course in the dental school. According to the temporary programme, issued January 20th, 1886, this course, which is obligatory for those who want to pass the final graduation, extends over 4 successive half-yearly terms. The school opened for work February 1st, 1889, and the first graduation took place December, 1890, and January of the present year.

Simultaneously with the establishment of a regular examination in 1873, the Government provided *Regulations for the practice and limits of dental surgery.* While this, as hitherto, was free to qualified practitioners, the Announcement from the Ministry of Justice of March 3rd declares: "The license to practise dentistry, which is granted by the Ministry of Justice, can not be expected granted in the future, unless the person concerned, who must have completed his 25th year, and must prove by certificates from trustworthy men that he has led an exemplary life, has passed the examination prescribed in the above mentioned announcement of March 1st, 1873, from the Ministry for Educational Matters. As to the limits of dental practice, he, to whom the said license is granted, is entitled, in the place where he resides, to clean, fill and extract teeth, to insert artificial teeth or sets of teeth, and to treat the diseases of the teeth and gums; other surgical or medical practice is not allowed the dentist." Of special regulations may be mentioned, that the dentist is entitled to compound and dispense himself those medicines for external use, which he employs, but only to his own patients; medicines for internal use the dentist is not entitled to prescribe, and he must only produce general anæsthesia with the assistance of a qualified practitioner. It may be noticed, that according to Royal Act of April 28th, 1877, women have the same access to the procuring of a license to practise dentistry.

Whilst it has not been found difficult to carry out in practice the *limitation* established by these Regulations as against surgical practice proper, the limitation of dental practice as against the free trades has given rise to various doubts, and discussions resulting therefrom, and has been the occasion of numerous law suits about illicit dental practice by unqualified persons. This movement dates from the beginning of the forties; down to 1843 the insertion of artificial teeth was admitted by all to be part of the practice, reserved to authorized dentists, but in 1844 the Board of Justice, in consequence of a law suit, decreed, that the manufacture and insertion of artificial teeth must be considered free trade; this view has been maintained ever since by the Ministry of Justice also, and thus a special class of unauthorized "dental mechanics" has sprung into existence, for whom the Trades Regulations of 1873 for the Metropolis have created a special license as manufacturers of artificial teeth. That which has specially given rise to doubt, is the understanding of the question, how far the preliminary treatment of the patient's mouth, necessary for insertion of artificial teeth, requires medical knowledge; and the said law suits have as a rule proved, that the unauthorized "manufacturers of artificial teeth" in order to insert artificial teeth, are compelled to constantly transgress the law, owing to their being forbidden to perform any operation whatever, consequently neither extraction, cutting nor filing of teeth or roots.—In this connection it may be mentioned, that, from a Statement of the Ministry of Justice under June 14th, 1881, the name *dental surgeon* (or Dentist) is not a monopoly of the authorized dentists according to Danish legislation.

As mentioned above the dental education sorts under the Ministry for Educational Matters, while the profession of dentistry, being a part of the civil medical profession, otherwise sorts under the Ministry of Justice with the supervision of the Royal Board of Health.

Since 1873 an Association of Dentists has been in existence, which during the first years of its existence was principally occupied with prosecuting infringements upon the practice of dentistry by unqualified persons, but after the re-organization of the Association in 1881 had increased its membership, it has taken an interest in scientific as well as in professional questions, and been particularly active in raising the standard of education of dental students. The Association, which counts more than ⅔ of all Danish dentists amongst its members, during the winter holds frequent meetings for discussion, and edits now for the 3rd year a Journal for Dentists.

Number of Dentists. How excessive the development of the dental profession has been during the last generation, will be evident from the fact that at the beginning of the fifties only 7, but in 1870 about 40, and in the middle of last year 100 dentists existed in Denmark. On the other hand, the decrease of the above mentioned medical fraction of dentists appears from a calculation made at the periods mentioned, since respectively 60, 12, and in 1890, 5 per cent. only of the total number of dentists were qualified medical practitioners. —To exemplify the proportion generally between the Metropolis and all the other towns of the country, it may be mentioned, that more than half of all dentists practise in Copenhagen. *Denmark, its Medical Organization &c.*

REMOVAL OF THE SUPERIOR MAXILLARY NERVE.

Mr. Victor Horsley excised the right superior maxillary nerve of a woman, æt. 45, for intense neuralgia. He said it was a good sign in this case that the disease was fairly localised. Ten years ago the patient had suffered fróm a very slight attack, which very soon passed away, the real malady commencing only three years ago; this, Mr. Horsley remarked, was but a short period to elapse before an operative interference, as patients have generally been under treatment for about ten years before an operation is undertaken, but in his opinion it was far better to operate comparatively early as then all the branches of the nerve are not affected. The patient looked alcoholic, the attacks were worse at night. Mr. Horsley briefly alluded to the mutilation most of these cases undergo at the hands of dentists, but he said no blame was to be attached to the dentists, as the deferential diagnosis between neuralgia and pain in the roots of the teeth was most difficult: he also stated it was feared at one time that a change took place in the roots of the teeth after incision of the nerve, but this was not the case. In the present instance there was no evidence that the disease involved any branch but the middle division of the fifth; the patient was very neurotic, requiring an enormous amount of anæsthetic, as these cases always do. The first step of the operation was to stitch together with horse-hair the lids of the right eye; a horizontal incision was then made along the lower margin of the orbit, care being taken not to enter that cavity, and a vertical cut parallel to the nose carried down for about an inch and a half, nearly from the centre of the first; the periosteum was then elevated and the nerve discovered emerging from the foramen; an effort was made to separate the artery from the nerve; to do this, Mr. Horsley pointed out, was a great advantage, but it was not easy, and was not possible in the present case, so the artery was ligatured and a piece of silk put round the nerve, then the periosteum was turned up from the floor of the orbit, the eyeball being held up with a copper retractor. (Mr. Horsley said *en passant* that a thin elevator was required, the original performer of this operation used a cupshaped one.) The infra-orbital canal was next opened up with bone nippers; an electric light attached to the operator's forehead being now brought into requisition, the anterior dental was brought into view and about two inches of the superior maxillary nerve were excised. All small vessels were ligatured, hot perchloride solution was applied, and the wound sewn up with horsehair, one angle being left unclosed as there had been a good deal of oozing and there probably would be more, as Mr. Horsley pointed out, remarking that he generally in these cases closed the wound up entirely.

Medical Press and Circular.

ONE STEP IN ADVANCE.

By Oliver Martin, L.D.S. Ottawa, Ont.

The use of gold foil appears to prove itself superior for filling teeth, but it is difficult of manipulation, as the least moisture spoils its cohesive properties. To overcome this the patient's mouth is filled with napkins, paper, rubber dams, propped open with corks, jackscrews, until the eyes bulge out as if in the last agonies,—and the dentist in a nervous state at the rapid flow of saliva, knowing full well that after all his work of preparation he is likely to lose a good filling before he can finish it, as it will take an hour. It is to overcome these difficulties in large gold fillings, and at the same time remove a tax from the patients that the author wishes to take one step more in the manner of filling teeth.

Foil will always be used in small fillings of ten or fifteen minutes, but when it comes to a half hour, the system proposed is preferable. Take for example, a patient : three large gold fillings are to be inserted ; it will take at least three sittings, but often more. Prepare the cavities only at the first sitting, take an impression of them (wax is as good as the other materials), place a temporary filling of wax or gutta-percha, and dismiss the patient without fatigue to the patient or to the dentist, of consequence. The difference consists in making a perfect filling for these three teeth in the laboratory at leisure, independent of saliva. Mix enough plaster with fine plumbago to hold the plumbago together, and set ; oil the wax impression as for an ordinary plaster cast. While preparing the gold, place the mould to dry on the oil stove; use 22, fine gold, which is coin. It is fine enough for any filling; it will never change, but it will resist more attrition. The mould can be made of the plaster and plumbago alone, but small flasks in the form of the ordinary moulding would be better. The plaster mould should be tied together with a narrow band of tin, or stove-pipe iron. The three moulds ready, and placed in convenient position, melt the gold in a small crucible, and pour quickly; it will not do as well to have two fillings in one mould, as one or the other is likely to be imperfect. If the mould is well made, the filling requires but little trimming; the sprue cut off, it is ready. As every dentist understands moulding, it is unnecessary to explain it. The three fillings are now ready. When the patient makes her appearance, no dread is felt of saliva; the first filling is freed from the tooth, the cavity cleansed of wax particles, and the fit of the gold filling is tried and trimmed so that it will enter the cavity readily. Test the articulation, and trim accordingly. Everything being ready, a single napkin is all that will be needed. Mix oxide-chloride of zinc, or other of the plastic fillings—the oxide-chloride adheres to metals very firmly, and is preferred on that account. Where it does not cause too much irritation, line the cavity with it, using but little, but enough to be pressed out. When the solid gold filling is pressed in, there will remain just enough to fill the imperfect adaptation of the gold, and this is what is most needed. All the fine pits and lines of the cavity are filled, which is seldom accomplished with foil, up to the thin edge of the enamel. Owing to the nice fit of the gold, there is but little oxide exposed around the walls of the cavity to be acted upon by secretions, and the action is not the same, owing to the presence of gold, which plays with zinc. It will endure as much as the tooth substance, unless too much is exposed owing to a bad fit; in such a case, remove a little of the oxide, and fill with foil, which is the work of but a few moments. In finishing the filling do so from the centre of the filling towards the surrounding walls, as it spreads the gold over the thin line of the oxide. The antagonizing of the teeth will also spread the gold. Still there will be little danger of decomposition as it is but a film, and preserves bone very well.

Whatever defect occurs to a filling of this kind is from the exterior. In this manner three gold fillings are inserted at one sitting, with but little trouble to the patient, with satisfaction to the dentist that he has inserted with but one napkin a solid gold filling that will stand the test of time.

The principle of forming the fillings for large cavities in the laboratory instead of in the patient's mouth, doing away with the dangerous hand pressure, the terrible mallet, according to the patient's version of it, the fatigue of opened mouth for an hour and a half and more, clamps, dams, cords, weights, all to fight away the saliva in order to produce a solid gold filling; this is the step in advance. There are many advantages in this step in advance filling,—it is a solid gold, or tin, filling, with more power of resistance than can be produced with foil. It can be held in any form of cavity, with wire screws if it comes out; it can be replaced with fresh cement, at little expense to the patient. This will be quite an inducement to patients to have their teeth filled with gold. The foil filling will not allow to be drilled into; this will, and the many devices that can be brought into play on account of this privilege will soon manifest itself to the dentist, who will feel confident of securing his fillings. The cavity of the tooth should be shaped so as to allow the impression to come out without drag on the wax. Time will be saved by this in the adjustment of the solid gold filling in any tooth in any part of the mouth with less trouble, and a more permanent operation, than a small foil filling in the front teeth.

Dominion Dental Journal.

THE "WORLD'S" TESTIMONY.

At one period what were pleasantly understood to be the humours of dentistry provided a copious source of inspiration to contemporary caricaturists. Every collection of facetious prints was more or less abundantly supplied with specimens of their skill in the delineation of scenes of fun and frolic which the practice of the art and mystery of tooth-drawing seemed naturally and necessarily to suggest to them. In these it is true, no very large measure of either originality or variety was, as a rule, to be discovered. Sometimes the joke of the situation depicted consisted in an error as to the identity or the number of the grinders which were to be extracted. But more commonly the resources of the artist were exhausted in illustrating the difficulties incidental to process the of pulling out teeth at all. The patient and the operator were represented in a series of grotesque attitudes indicative of the severity of the struggle in which they were supposed to be engaged, the latter being usually portrayed in the act of dragging the former about by means of a pair of forceps of enormous dimensions and forbidding appearance. No more conclusive evidence of the advance which has been made in dental surgery of late years is to be found than in the fact that such caricatures are now entirely out of date. They are no longer produced because they are no longer amusing, and they have ceased to amuse because they have ceased to have any relation to actual experience. Dentistry has become a science, and in its operative and mechanical branches has attained to a state of perfection which would have appeared incredible only a generation ago. As a consequence of this, dentists who are willing to submit themselves to the requisite training and restrictions aspire to the position of professional men. They are examined and licensed by the General Council of Medical Education, and registered under its authority on conditions analogous to those which are imposed on medical practitioners generally.

The World.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual monthly meeting of this Society was held on Friday, April 1st, at 8 o'clock; W. Robinson Humby, Esq., President, in the chair.

The minutes of the previous meeting having been read by the Hon. Sec. and confirmed, the President gave the usual form of welcome to visitors present.

Mr. Robertson having been balloted for, was duly declared by the President to have been unanimously elected a member of the Society.

Mr. Spokes, under the head of Casual Communications, brought forward a case of a pulp stone (*in situ*) and showed a section (Weil's method) by means of the lime light; he said it was interesting, in that pulp stones sometimes attained such a size as to render root canal treatment difficult, and that when using the Gates drill and coming against a hard resisting sub stance deep down, one would naturally conclude he had drilled far enough, whereas in reality, part of the pulp had been left behind with possibly disastrous after results.

As no more Casual Communications were forthcoming, the President called upon Mr. Edmund Roughton, who gave a very interesting demonstration on "Tumours of the Jaw, and Micro-organisms of the Mouth," as reported on page 388. It was illustrated by museum specimens, microscopical preparations and micro-photographs projected on the screen by the lantern. He also showed a series of micro-photographic prints corresponding to the slides, and these he presented to the Society.

Mr. Spokes thought that considering the wealth of material Mr. Roughton had laid before them, the best that one could do was to allude to those points which were most interesting to the individual mind. For his part, he had been very much struck with the series of slides, which seemed to show the formation and elaboration of blood vessels, by a process of vacuolation in connection with myeloid cells. With regard to the different sections of tumours, he felt sure they must have been thoroughly appreciated by students, especially those who were going up for examination, and might be in doubt about classification of epulis.

Mr. Rushton said he should like to ask Mr. Roughton whether he considered the treatment of "Rigg's disease" he had described, had effected a permanent cure.

Mr. Clarence Read, (Guy's) said he should like to ask Mr. Roughton if he did not think that the last specimen of cystic tumour of the jaw, just shewn by him, resembled some of the higher developed, and consequently less malignant sarcomata ? it being composed of embryonic tissue developed a little short of fibrous tissue.

Dr. Maughan said it was with the greatest pleasure he followed Mr. Roughton's clear and original description of a myeloid sarcoma. To trace all the changes that occur while a myeloid cell becomes converted into a capillary blood vessel, was a feat he had never heard of before, and one on which the standard works on pathology were absolutely silent. His minute researches into the innocent multicystic tumours, sections of which he had shewn them were also exceedingly interesting and novel.

Mr. Woolf said he thought they ought to be very much obliged to Mr. Roughton for having favoured them with such an excellent and most interesting demonstration. He thought the subject, indeed, was one of great importance to them all, and should not fail to impress them with the necessity of keeping up a fair knowledge of general surgery, even after passing their dental examinations. He maintained that dentists had far greater opportunity of exercising their powers of observation than any other profession, and therefore, he thought they should exercise this power in the most advantageous manner, so that they might recognize these tumours in their infancy. Where doubt existed as to the nature of the swelling, a medical man should be immediately consulted, thus affording the greatest possible aidin the alleviation of suffering. He wished to ask Mr. Roughton if Aromatic Sulphuric Acid had been employed in that case of Rigg's disease, and if so, with what success? Regarding the case which he (Mr. Woolf) had had the opportunity of operating upon, it proved to be purely inflammatory, having been set up by an artificial plate, in which one of the porcelain teeth had become fractured; the sharp edge becoming imbedded in the gum, had kept up a continual source of irritation. Nothwithstanding this fact, the swelling was treated with suspicion more on account of the patient's age.

Mr. Reginald Bascombe said that he, like many others present, was going in for the L.D.S. examination in May, and had come, as they had, hoping to reap benefit from the demonstration given by Mr. Roughton on "Tumours of the jaw;" a subject, which from an examination point of view was to them of vital interest; he felt certain that he was but uttering the unspoken, but unanimous, thoughts of the others, when he said that their expectations had been more than fully realised. With regard to the multilocular cystic tumours which Mr. Roughton had described, he should like to know if the intercystic septa were ever osseous as well as fibrous? With regard to the epulides, he only wished the text books described them as explicitly as they had just heard them described. The arrangements by different authors were very perplexing to a student reading them for the first time, for example, the following was the classification given by one of the Standard text books.

1. Fibrous Epulis.
2. Myeloid Sarcoma (myeloid epulis).
3. Carcinoma (Malignant Epulis).

The President invited Mr. Roughton to reply.

Mr. Roughton thanked the members present for the very kind way in which they had received his communication.

He fully agreed with Mr. Woolf that it was of extreme importance for dental surgeons to be familiar with surgical affections of the mouth and jaws, especially with their earlier manifestations, for it was then that surgeons could afford relief by operation. Cases of malignant disease, if over looked, soon assumed such formidable dimensions that nothing could be done with any prospect of success.

With regard to the case of Rigg's disease, he said that aromatic sulphuric acid had been used ; it had improved the condition of the gums to a certain extent, but had done nothing to stop the suppuration.

In reply to Dr. Maughan, Mr. Roughton said that as far as he was aware, his observations on the myeloid cells and their conversion into capillary vessels were original. He hoped at some future time to work the subject out more thoroughly, and place his results before the profession in a more comprehensive manner.

In reply to Mr. R. Bascombe's question, Mr. Roughton said that in the museum of St. Bartholomew's Hospital, there was a dried specimen of a lower jaw, which had been affected by multilocular cystic disease. The bone was expanded into a number of cavities which had contained the fluid, and soft solid portions of the tumour, and thus the cyst had a long wall, but this was no part of the tumour itself, being simply the bony substance of the jaw, expanded by the growth of the cyst inside it.

He fully concurred with Mr. Bascombe that the classification of epulides (and indeed many other things) in the text books was unsatisfactory. He advised all students to endeavour to make classifications of their own ; nothing in his opinion was a greater help to the memory.

In answer to Mr. Clarence Read, Mr. Roughton said that the connective tissue in the specimen referred to was not fully formed fibrous tissue, and therefore might possible exhibit, clinically, signs of a low degree of malignancy.

In conclusion, Mr. Roughton proposed a cordial vote of thanks to his friend, Dr. Cosens, who had so kindly lent and manipulated his magic lantern on this occasion; this was carried by acclamation.

The President proposed a hearty vote of thanks to Mr. Roughton in which he felt all present joined, and then adjourned the meeting till Friday, 6th May, when Mr. W. J. Fisk will read a paper.

Review.

Practical Notes on Nitrous Oxide. A Brochure by T. Ottley Atkinson, L.D.S. Eng. T. Wilson, Kendal, 1892.

Some of our readers will remember that Mr. Atkinson's views with regard to nitrous oxide appeared some time ago in the *Journal*, and that they did not pass without criticism. He has now published them in a separate and more extended form. We know that frequently it becomes necessary for the operator to be also the administrator, and are prepared to read anything in the way of an apology for, or at least an explanation of, such a practice, but we cannot agree with the author that the routine combination of the duties of administrator and operator gives the most beneficial results in the best interests of the patients. The fact that the operator considering himself "the best judge of his own wants will push the gas judiciously," constitutes, in our opinion, a possibly dangerous element in the case. The author here claims, perhaps correctly, that the physiological action of nitrous oxide is not exactly known, and that the gas may be judiciously pushed. On page 18 he states that nitrous oxide has barely reached the threshold of its capabilities as an anæsthetic, but on page 27 he thinks the knowledge of the gas and its administration has reached a state of almost perfection. Indeed it may here be mentioned that it is necessary to read he whole book carefully through, for what may be considered objectionable on one page, is frequently found to be modified in another place. Thus it is stated on page 11, if definite lesions are known or suspected to exist, a more thorough and complete investigation should of course be made . . . the welfare of the patient is never to be disregarded in order that the dentist should be protected against very remote contingencies. But on page 19 the case of a lady is given, where heart trouble was suspected, and the author firmly refused the gas, in spite of the patient's wishes, although nothing is said as to a more thorough and complete examination. The teeth were extracted without an anæsthetic, and, as the lady died suddenly five months afterwards, the author thinks it fortunate the gas was refused. For our part we are equally inclined to congratulate him that the patient did not die from shock at the time that the teeth were removed.

On page 13 it is advised that the gas in all cases should be fully given until stertor, jactitation, and other well-known symptoms warn the administrator to desist, but on page 29 is the account of a case in which these symptoms were entirely absent, although closely watched for, and we are not surprised to hear that there ensued complete arrestation of respiration, and we are next told "though never to be disregarded by the gas anæsthetist, stertor, jactitation, and the conjunctival reflex test are by no means to be implicitly relied upon; occasions may and do occur when one, or all, may be entirely absent."

Page 23. "Hysterical patients are regarded as the most troublesome, and if it be suspected from a patient's general appearance and behaviour that she is likely to give unusual trouble, it is better to refuse her the gas, rather than subject oneself to the consequent annoyance that might arise from its administration." This seems scarcely fair towards such patients, especially as, on the other hand, the author believes that the experienced anæsthetist has little to fear from erotic and other awkward manifestations, and that they can rarely be justly attributed to the temperament of our patients.

The author properly points out that asphyxia is the emergency most to be watched for, and we agree that when due to the presence of any foreign substance it is to be promptly removed. "In the majority of cases this treatment will be found sufficiently effectual, but when necessary recourse must be had to artificial respiration." Here we think some mention should be made to the performance of, at least, laryngotomy, for in the event of a foreign body so lodged in the larynx as to prevent inspiration, and not to be immediately recoverable, it might be worse than useless to attempt artificial respiration instead of letting air in below. The ability to perform this operation must certainly be added to the list of duties of the administrating-operator, for even if skilful extraction could always prevent a tooth being fractured, or dropped, yet, as has happened, a broken portion of forceps may cause trouble. The author appears aware of the responsibilities in producing anæsthesia. "The calling of a gas specialist is exacting in its demands for much personal devotion, necessitating a careful and regular mode of life, observing early hours, and avoiding late suppers in order to maintain all his energies at the highest pitch and in the most perfect tone." We can praise him for such self-sacrifice, although we cannot agree with his statement that "no other anæsthetic requires the same amount of care and skill in its exhibition as nitrous oxide." We can also agree with him when he combats the idea that the action of gas is due to its producing asphyxia, and when he condemns the use of supplemental bags. We are sorry, however, that he has found it necessary to formulate a charge that in hospital practice other methods of a more or less objectionable character are adopted with a view to economy. "Examinations, such as passing the hand down, and under the dress . . . are in the main to be avoided," expresses a proper view none too strongly. Three plates are to be found at the end of the book illustrating the author's particular views.

Dental News.

DENTAL MANUFACTURING COMPANY LIMITED.

It is always a pleasing duty to comment on "success," and it may interest many of our readers to cull from a parcel of reports, statements, balance-sheets &c, now lying before us, some items of the satisfactory condition of the Dental Manufacturing Company Limited, after its eighteenth year of existence. From these it appears that its business so steadily increases year by year, that within the past seven years its sales have almost doubled, viz., from £29,000 in 1884 to £59000 in 1891. This immense increase seems to have rendered its old capital of £60,000 inadequate for duly working such expansion, so that last year its directors sought for and obtained powers to increase the capital to £100,000, but wisely put only £10,000 worth of the new stock on the market, this, however, has already been more than two-thirds taken up. It is a pleasing feature that these new shares take equal rank and dividends with the old ones, and also that they are not restricted to "Dentists," thus enabling the families and friends of practitioners to share in whatever good things may be going. Another gratifying item is, that pending the issuing of this new stock, extra capital being required from time to time for further development of business, loans had to be resorted to, which always were almost entirely supplied by the Board, who, having the affairs of the company at their fingers' ends, showed, to say the least, entire confidence in its stability, as this formed their only security, they having no debentures or other special lien, but simply hold the same position as any other ordinary creditors.

As a result of last year's transactions the directors were enabled to declare their usual dividend of 6 per cent., to place another thousand pounds to the reserve profit account (now some £4,000 which should eventually meet all advantageous opportunities or sudden emergencies of trade, and so avoid borrowing at interest) and congratulate each other, their energetic staff and the shareholders, on the company's present position and future prospects.

As the Company appears to reckon trade stock at cost price, steadily pay off plant, and other like expenses, reduce the ratio of working expenses to business done, whilst also keeping the stock in hand, and realisable book-debts about equal to the capital invested, there can be no reason to doubt that with intelligent and prompt appreciation of the profession's requirements, it should continue to attract a due share of the profession's custom and be, as heretofore an ever increasing concern, giving satisfaction alike to its Directors, its Shareholders and its Cliental.

DISCOVERY OF MAMMOTH REMAINS.

Mr. H. Hicks, honorary secretary of the Geological Society, writes as follows to the *Times* :—"During some recent excavations in Endsleigh-street, in connection with the deepening of the main sewer, the workmen came upon remains of a mammoth and other prehistoric animals at a depth of about 22ft. from the surface. In the central excavation, near the north end of the street, two large tusks of a mammoth were met with lying near together along with other bones belonging to the same animal. A portion of one of these tusks was brought to the surface, and it was found to measure at its thickest part nearly 2ft. in circumference. The length of the complete tusks would probably be at least 9ft. or 10 ft. In another excavation on the west side of the street, at a distance of about 15ft. from the above-mentioned, the lower jaw and other bones of a younger mammoth were discovered at about the same depth from the surface. It is evident that the animals must have died at the spot where the remains have now been found, and the dark loaming soil in which they were embedded has yielded on examination many seeds of contemporary plants. Deposits usually classed with the high level gravel and brick earth of the Thames Valley were found overlying the animal remains ; hence the geological age during which the animals lived, in my opinion, must be included in what is known as the glacial period."

NOT a hundred miles from Brixton Station is to be seen the announcement, immediately under Dr.——, surgeon, physician, apothecary, &c.—

TOOTH GOT OUT
ONE SHILLING
WHILE YOU WAIT.

Could not the learned doctor devise some means by which heads could be left in the morning and called for at night ?—thus demonstrating the saying of "losing one's head."

Chemist and Druggist.

WORLD'S COLUMBIAN DENTAL CONGRESS.

THE following names occur in connection with the Committees appointed for the meeting at Chicago next year :—

Committee of Conference.—Chas. S. Tomes, London; W. H. Coffin, London; W. B. Macleod, Edinburgh; A. W. Baker, Dublin.

Committee on the History of Dental Legislation.—J. H. Mummery, London.

Committee to Promote the Appointment of Dental Surgeons in the Armies and Navies of the World.—George Cunningham, Cambridge.

Committee on care of Teeth of the Poor.—W. M. Fisher, Dundee.

Committee on Microscopy and Bacteriology.—J. H. Mummery, London; D. E. Caush, Brighton.

IN the course of his graduation address at Edinburgh Professor Chrystal said, "I think, the tendency to press young men at once into the business of life is being overdone. It lowers the standard of the professional classes and it aggravates the block in these lines of life of which so much is heard and which has irritated so many of our educational diseases to the stage of acuteness. Moreover, it is a mistake from the point of view of the individual, for I have noticed with satisfaction that of the few Arts graduates that now enter medicine for instance, a very large proportion are to be found among those that ultimately distinguish themselves by success in their profession."

Sir Arthur Douglas Brooke, Bart., has presented to the College of Surgeons, a valuable collection of fourteen skeletons, eighty-eight skulls, and seven crania, which had belonged to his father, the late Sir Victor Brooke.

ROYAL INSTITUTION.—The Friday evening meetings will be resumed on April 29th, when Dr. Benjamin W. Richardson, F.R.S., will deliver a discourse on the Physiology of Dreams.

VEGETARIAN DIET. *Post hoc ergo*—? Two gentlemen have come forward with a novel and convincing reason—convincing, anyhow, to themselves—for the substitution of vegetarian for meat diet. One suffered from chronic toothache, which has disappeared completely under the soothing and magic influence of a four years' vegetarian regimen; another has found the diet equally efficacious in its effect upon bronchitis. Some people may doubt whether there is the close connection between cause and effect assumed by these enthusiastic apostles of vegetarianism. Unfortunately we do not know whether Nebuchadnezzar enjoyed unusually good health when under compulsory abstinence from flesh, or valuable light would doubtless be thrown on the question.

The Hospital.

APPOINTMENT.

William Wallace, M.A., L.D.S., has been appointed Lecturer on Dental Anatomy and Physiology at the Glasgow Dental Hospital, *vice* J. C. Woodburn, M.D. Glas., resigned.

Michael Y. Woolf has been appointed Dental Surgeon to the Girls' Home, Marylebone Road.

VACANCY.

Liverpool Dental Hospital. House Surgeon wanted. Application to be made to the Dean on or before May 16th.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

DEAR SIR.—I shall be obliged if you can find room for a short explanation with regard to the two diagrams which appear in the paper "On some points in Contour Filling," in the B.J.D.S., for April 15th. pages 345 & 346.

Through an error of the printers, Fig. 1. is produced *inverted* and thus does not correspond with Fig. 2, and the arrows in Fig. 1. have thus no connection with the filling indicated in the second diagram, and I am thereby further made responsible for suggesting that the three upper molars occupy a *greater* space than the three lower ones.

I am,
Yours faithfully,
FREDERIC. W. MINSHALL.

Dental Hospital Reports.

Statement of Operations performed at the Dental Hospital of London, Leicester Square, for the month of March, 1892.

Extractions	Under 14	401
	Adults	1258
	Nitrous Oxide	1353
Gold Fillings		747
Plastic		1306
Treatment of Irregularities of Teeth—cases and visits		
Artificial Crowns		73
Miscellaneous Cases		523
Total		5661

House Surgeons
Percy Webster,
Charles J. Allen,
Ernest Gardner.

Work done at the Victoria Dental Hospital of Manchester, during the month of March, 1892.

Number of Patients attended	920
Number of Extractions	715
Number of Extractions under Anæsthetics	169
Gold Stoppings	76
Other Stoppings	228
Miscellaneous	95
Crowns	7
Irregularities	28
Total	1318

T. E. Sherratt,
House Surgeon.

STATEMENT OF OPERATIONS performed at the Birmingham Dental Hospital for three months, ending March 12.

	Jan.	Feb.	Mar.
Extractions under Anæsthetics .	339	383	443
,, Without Anæsthetics . .	406	411	457
Gold Fillings	69	42	67
Amalgam Fillings . . .	45	58	77
Osteo Fillings	69	111	73
Permanent Gutta Percha Fillings .	12	18	16
Temporary Gutta Percha Fillings .	30	23	17
Dressings (nerve canals treated &c. .	139	197	140
Scalings	10	9	9
Crowns, regulations and attendances on ditto	49	49	62
Miscellaneous and Advice . .	218	225	237
Total number of Operations . .	1387	1516	1569
,, ,, Patients attending .	726	798	869

PERCY T. NADEN,
House Surgeon.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
3. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
4. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
5. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under:

Twelve Months (post free) - -	14s. od.

Post-office Orders to be made payable at the Langham Place Hotel Offices to G. E. Skliros, 289 & 291 Regent Street, W. A single number sent on receipt of seven (penny) stamps.

British Journal of Dental Science.

No. 584. LONDON, MAY 16, 1892. Vol. XXXV.

STUDIES ON THE GROWTH OF THE JAWS.*

By C. S. Tomes, M.A., F.R.S.

In the Museum of the Royal College of Surgeons there is a series of models which, so far as I know, has hardly received the close attention which it deserves. It was prepared by the late Mr. Merryweather, and consists of a very complete set of models of the same mouth, beginning at the age of 4 and continuing up to the age of 21, the models being taken at short intervals during all the earlier years, and at longer ones during the later period of the term. I believe the series to be unique, and great value was attached to it by Mr. Merryweather, who never allowed anyone access to it.

It affords a means of checking various more or less theoretical conclusions, as to the methods of growth of the jaws, which have been drawn from the study of separate dried specimens, these conclusions themselves having a very direct and practical bearing upon the subject of the treatment of irregularities. In the first edition of his "Dental Surgery" my father pointed out that it was possible, by a series of measurements of a large number of children's jaws (the specimens upon which he worked being now nearly all deposited in the museum of this Society), to ascertain in what directions increase took place and in what it did not; and although these researches have obtained general acceptance and have hardly been seriously combated, it will nevertheless be interesting, and indeed may serve to still further emphasise them and to convince those who may perhaps be inclined to think that considerations of this nature do not greatly influence our everyday practice, to somewhat closely study this series. And first I would remind you that the most important generalisation then drawn was that in the region of the jaws occupied by the twenty temporary teeth very little growth or change subsequently takes place, so that it comes to pass that the incisors, canines, and bicuspids ultimately occupy an arch which hardly differs either in size or shape from that occupied by their predecessors.* If, then, in the treatment of irregularities, whether threatened or accomplished, we expect improvement due to growth in this anterior region of the mouth we shall be disappointed ; yet how seldom, if we read the lengthy and involved dissertations which from time to time appear upon this subject, is this fundamental truth fully grasped.

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* Read before the Odontological Society of Great Britain.

It may be thought that this point about the very small growth of that portion of the jaws occupied by the temporary teeth had been already proved *ad nauseam*, and that anything more was superfluous. But the proofs adduced have been based upon measurements of dried jaws, or else are averages taken from a number of children and a number of adults. Now there are several possibilities of fallacy in such averages -- thus it is difficult to be certain that the children and the adults belonged to the same grade of society, as the former would probably be gathered in some institution. Or it is possible that the children giving the smallest measurements were puny and stunted, and that few of them would survive to be represented amongst the adults. And therefore, notwithstanding the concurrence of all the evidence thus accumulated, the record of what actually happened during the growing up of one individual is well worth the trouble of close examination.

My father's research was conducted principally upon the lower jaw, this affording convenient points of measurement not existing in the upper jaw. I have, therefore, in my study of this series of models, devoted my attention to the upper jaw, this course appearing to afford the best check upon the older observations. In order to give as much precision as possible to my examination, I selected points for measurement, which should be, as far as may be, applicable equally to models and to macerated jaws.

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* It is not generally known how slight an increase in the arch allows of the replacement of the deciduous teeth by their apparently much larger successors. Measuring the space occupied by the temporary teeth of this series along the centre of their grinding surfaces I find it to add up to 35 millimetres, and that by the permanent teeth which replaced them only to 37 millimetres. A very slightly more outward position would easily accommodate this small difference.

For width I took the distance between the middles of the grinding surfaces of the second temporary upper molars, and, afterwards, of the second upper bicuspids. For length I took the distance from the middle of the back edge of the grinding surface of the second temporary molar to the centre of the back of the neck of the central incisor of the same side, at the point where the gum joins it. The results are here tabularised.

Years.	Length.		Width.
4	Right 26.6 mm.	Left 26.5 mm.	40 mm.
6	26.5 ,,	,, 26.5 ,,	39.5 ,,
10	,, 27.3 ,,	,, 27 ,,	40 ,,
12	,, 27.4 ,,	,, 27 ,,	40 ,,
13	,, 27.2 ,,	,, 26 ,,	41 ,,
15	,, 27 ,,	,,	
16½	,, 25.3 ,,	,, 23.5 ,,	41 ,,
21	,, 25.8 ,,	,, 23.2 ,,	(41) ,,

It will be noticed that there is a difference in the length measurement on the two sides, to which I shall recur later; and that the width measurement at the age of 21 is enclosed in brackets. This is done because it is not the actual, but a corrected measurement; the second bicuspid on one side is displaced a little inwards, and this has been allowed for. I may mention also that there are some thirty models, all of which I measured; a few are disturbed by loosening temporary teeth, visibly displaced, and these I have rejected, those given being enough to illustrate my point. If we proceed to summarise the data before us we find that in the region occupied by the temporary teeth, there was from the age of 4 up to 15 only a very slight gain in the length—not quite a millimetre—whilst in width there is about the same.

Up to this time the course of nature had not been interfered with, but the mouth being somewhat crowded at the age of 15 the first upper bicuspid on the left side was extracted, with the result that at 16½ the left length has fallen two and a half millimetres, but what is very remarkable, the right measurement (no tooth having been extracted) has also fallen more than a millimetre: and this diminution proves to be permanent, as at 21 the measurements are the same. An examination of the lower jaw leads to the same inference, namely, that there is no increase whatever in the portion of the jaw occupied by the temporary teeth, but in this there were points to which I shall have to recur.

Having thus far met with full confirmation of the accepted ideas, it occurred to me that it would be interesting to see what happens during the growth of the anthropoid apes. For this purpose of course there are only skulls of different individuals to be obtained, but fortunately the data obtainable by taking measurements from a good many individuals and averaging them are sufficiently striking. An examination of all the skulls in the College of Surgeons' Museum shows that in this respect, as in other points in its dentition, the chimpanzee comes nearest to man, though in it the growth in the region in question is marked enough :—

CHIMPANZEE.

Temporary dentition complete ...	Length	27 mm.
	Width	30 ,,
Adult Females	Length	33 ,,
	Width	45 ,,
Adult Males	Length	37 ,,
	Width	50 ,,

Thus, whereas in man there is practically no gain, in the female Chimpanzees there was 6mm. in length, and 15 mm. in width. In the larger males there was 10 mm. length, and 20 mm. in width.

In the orang I found :—

Deciduous dentition complete ...	Length	33 mm.
	Width	35 ,,
Adult Females	Length	38 ,,
	Width	48 ,,
Adult Males	Length	44 ,,
	Width	58 ,,

And in the gorilla :—

Deciduous dentition complete ...	Length	33 mm.
	Width	33 ,,
Adult Females	Length	41 ,,
	Width	50 ,,
Adult Males	Length	47 ,,
	Width	53 ,,

It seems, therefore, clear that in the matter of the absence of growth in the anterior region of the jaw, man stands alone, the orang differing from him more than the chimpanzee, and the gorilla still more, gaining no less than 14 mm. upon an original measurement of 33.

Now it is, of course, well known that in man the suture separating the intermaxillary bone from the maxilla anchyloses early, and is no longer traceable. In the anthropoid apes it remains open, though in the chimpanzee it disappears more or less completely. It seemed to be desirable to trace the growth of this bone, in order to see whether that is the main factor in bringing about the difference, and I have constructed a series of diagrams to bring this and the other measurements graphically before you.

In all of these diagrams the horizontal lines give the width between the centres of the grinding surfaces of the second temporary molars and afterwards of the second bicuspids; the oblique lines the measurement from the centre of the back edge of the second temporary molars to the back of the neck of the central incisor of the same side, and in the case of the apes the strong vertical line the antero-posterior length of the inter-maxillary bone.

The mark on the vertical line represents the length from before backwards of the intermaxillary bones. From it you see that in the chimpanzee it grows from 8 mm. to 14 in the female, and 19 in the male. In the orang from 11 to 15 and 18; in the gorilla from 19 to 22 and 27. Its elongation, therefore in the chimpanzee, is enough to effect the whole increase in length forwards, but it is not so in orang and gorilla, in which there must be growth on that edge of that maxilla itself, and a forward movement of the whole bone bodily. Tracing this out with greater care I found that from the period at which the deciduous teeth were all in place up to the period at which the first molar was cut, growth was most active, and the greater part of the increase was already attained, but that it was not complete till the attainment of the full permanent dentition.

As in man there is no growth in this direction, and in chimpanzee less than in orang and gorilla, and this corresponds with the periods of obliteration of their intermaxillary sutures, it seems a fair inference that these two facts are related as cause and effect, and, so far as it goes, is a good argument against interstitial increase of size taking place in bones.

And it may be further observed that the elongation of the intermaxillary bones bears an apparent relation to the extent of development of the canines, whether we compare different genera, or the two sexes of the same genus, so that it would seem that in the upper jaw the space for them is thus provided

Of course the smaller measurements obtained for the adult females are partly due to the smaller size of the animals, but more particularly have relation to the difference in the sizes of their canines.

And I may say of all these measurements that, although averages of a good many specimens, I attach little importance to the absolute dimensions given, for some purposes the points chosen may have been badly selected, but as they are the same in all the specimens they at all events serve for comparison.

It would be very interesting to ascertain if the prognathism of the African races, can be due to the intermaxillary suture remaining open to a later date than in European races, but there is no material in this country, that I am aware of, for ascertaining this.

To return to our series of models, it is in some ways to be regretted that the mouth in which they were taken did not turn out to carry regular teeth, for it might be said that the crowding which obtained here was due to a want of growth which in a normal mouth would have taken place.

But there is another and sufficient cause for that amount of crowding which did occur; the upper incisors instead of taking their usual slight forward inclination, remained vertical, in that position which we are accustomed to regard as appropriate to the temporary teeth, and this of course involves a slight loss of space; while the lower incisors very soon after their eruption, rose up so as to touch the gum behind the uppers, and this, the uppers being too vertical, necessarily involved the lowers having a distinct lean backward. The result of this was that it became necessary to extract a bicuspid on each side, so that there was at the last a material shortening of the measurements in the lower jaw. And though I at first regretted that the mouth was not strictly regular, I afterwards came to be glad that it was not, for a closer study of its irregularity led to some interesting suggestions.

In the table of measurements it will be observed that after the age of 12 there is an inequality between the length of the two sides, and this inequality had established itself, although exactly the same teeth had been shed and retained upon the two sides.

Now this is very interesting, because any one looking at the mouth a few years later would have certainly attributed it, without the least hesitation, to the extraction of a tooth on that side. That such a verdict would have been quite wrong is evident, for here we see the first molar advancing on one side and not on the other, although both sides have the same teeth, and there are no interspaces.

It seemed, so to speak, predetermined while the second bicuspids and the canines were still within the bones, and their predecessors still in place, and it may possibly have been due to their position in their crypts, but certainly not to anything that happened above ground.

These teeth were late in being erupted, but their predecessors held the ground for them, and the second deciduous molar is actually bigger than its successor, so that their late eruption fails to account for it.

Again, I have alluded to the uprising of the lower incisors; this also is foreshadowed pretty early, immediately prior to the shedding of the temporary teeth, and it is fully established at the age of 11, when the lower incisors (the second temporary molars still persisting) have risen up so that they are too high by at least their own length. Now that this was due to some inherent vice, and not merely to their not having met the opposing teeth, is shown by their having been forced to take a very backward inclination by having impinged upon the backs of the upper incisors. I do not wish to build too much upon an individual series of specimens, but it seems that so much can perhaps be learnt from such a series that I would urge those who may have the opportunity to take models of the mouths of their own children from the ages of 6 onwards to maturity; so far as I can see there is not much to be got by taking them earlier, and a model a year up to the age of 14, and then one every two years, would amply suffice.

In conclusion, the two points to which I would call attention are (1) that the early attainment of its full dimensions by the anterior portion of the jaw is an essentially human character; (2) that in the studies of irregularities a too mechanical view of their origin is to be deprecated; their origin is probably to be sought earlier than we are accustomed to look for it, and its more early recognition may perhaps help us to combat it more efficiently. In this mouth the articulation was fairly complete in its crowded condition, and became less so after the extractions and subsequent attainment of regularity in the teeth of the two jaws taken separately; perhaps an earlier recognition that extraction or some other treatment would be called for would have eventuated in a more perfect articulation.

APPROXIMAL CAVITIES.

By L. Matheson, L.D.S.E.

I feel that I owe to you a twofold apology. In the first place, anyone reading the title of my paper might be justified in supposing that I propose to deal *in extenso* with the very large and far reaching subject of approximal cavities. I have no such monograph to offer you. In the second place, it might well be thought, that in offering some communication on such a time-worn topic, I must have something new to bring forward, whilst in truth such is not the case.

All I have done is this,—to group together (in a somewhat arbitrary fashion), a few principles and methods of practice in such a way as to stimulate, if possible, some interchange of opinion and experience which may not be altogether valueless.

To my mind there is no more important subject in the wide range presented by dental surgery than that of approximal cavities.

Approximal decay is the most destructive, and, at the same time, the most difficult condition of disease with which, as engaged in the practice of conservative dental surgery, we have to deal. Its ravages—so varied are they in extent and character,—call for such varied treatment, and one's decision as to the best treatment in any particular case involves so many considerations, that for my own part, I have never joined without profit, in the repetition and discussion of the several aspects of the subject, however frequent such discussion may have been.

I propose first to consider cavities in incisors and canines, and then to pass on to bicuspid and molar cavities.

To begin with, there is the question of temporary separation. I am a strong advocate for this preliminary measure, believing, as I do, that without it there are many cavities it is impossible to get a clear view of, much more to prepare and fill successfully, and that even in the case of easily accessible cavities much time is gained by having plenty of room to work in.

The plan I formerly adopted was to separate by means of successive folds of narrow tape, and then to steady the teeth in their new position by placing non-elastic gutta-percha for three days in the space obtained. At the end of a week after the insertion of the first tape, I operated, generally maintaining the space during the operation, and keeping the teeth rigid by the use of a wooden wedge, applied at the cervical edge.

Since I became the happy possessor of a Perry two-bar separator, I have almost entirely discarded the use of tape and gutta-percha. For by means of this admirable little appliance, it is possible, in the great majority of cases, to obtain in a couple of minutes, quite sufficient space to work in, without the application of any previous pressure; and at the same time the teeth are held perfectly rigid, and the cervical edge of the cavity (unless very extensive) is not encroached upon, as it often must be by a wedge. And all this saving of time and discomfort, this rigidity of the tooth to be operated upon—a matter of great importance from the patient's point of view,—and this free exposure of the cervical edge, all these favourable conditions are obtained without any pain to the average patient, and with such a minimum of pain to even nervous patients, that they always declare themselves in favour of the separator as compared with slow wedging by tape or rubber. I may observe, however, that care ought to be exercised in the application of the instrument to hold it firmly in place with the left hand, whilst the screws are being turned with the right, otherwise much discomfort may be occasioned by the separator twisting out of position. Then, also, it is well to apply a saturated solution of cocaine to the gum between the teeth to be separated, where the necks are unusually narrow, as in such cases the blades of the separator tend to slide up the roots of the teeth, and to press heavily on the gum. Very occasionally, where the teeth overlap much, or are in some other way irregularly placed, it is not possible to apply the instrument, but these instances are quite exceptional.

Space having been secured for working in, the preparation of the cavity next demands attention.

Why is it that there is so frequently a recurrence of decay on the approximal surfaces of incisors that have been filled—in spite of the careful removal of decayed tissue, and the insertion of a solid filling perfectly adapted to the margins of the cavity?

There are some reasons for this disappointing recurrence of decay which I shall touch upon presently, but at this stage of my paper, I would mention three which I believe to be of great importance :—

(1.) The first is that, whilst a cavity itself, when prepared, may be thoroughly cleared of decay,—a film of porous enamel, so thin as to be scarcely observable,—may be left at the cervical edge, and in small cavities, this film generally extends round the whole margin. (Fig. 1.) If the slightest moisture is allowed,—and this may often happen, even with the rubber-dam in place—to creep up to the cervical edge, such a film as I refer to may very easily be overlooked, and the filling subsequently inserted will be doomed.

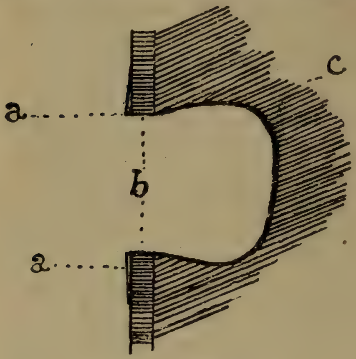

Fig. I.

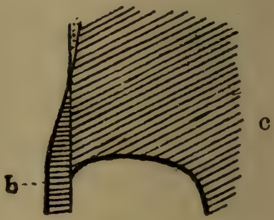

Fig. II.

When the chalky line is clearly made out, and when once on the look out for it, there is no excuse for missing it, the best way of removing it is by a fine convex taper file, or by one of Hallam's plug finishers, or a fine corundum disc, if space permits.

(2.) The second reason of the three I spoke of, is, that the cervical edge, though quite freed from all defective tissue, may be left so frail as to give way under the pressure used to insert the filling.

In most cases it happens, that the diseased dentine extends much further than the diseased enamel does in the direction of the root, so that when all decay in this part has been thoroughly removed, there is found remaining a very deep pit, having for its outer wall a thin shell of enamel, entirely unsupported by dentine. (Fig. II.) This shell, especially if the cavity is close to the gum, is even more fragile than it appears to be, looked at edge-ways, for it cannot be too strictly borne in mind, that where the enamel meets the cementum, it tapers off to a feather edge, which, unless the teeth are above the average strength, cracks and flakes away under very little pressure indeed. And we may often be nearer to this feather edge than we suppose, for one is apt to forget that the margin of the enamel does not reach as far towards the root on the approximal surfaces of incisors as on the labial and lingual surfaces.

With the hope of its affording a good anchorage for one's filling, the temptation may be strong to leave this pit, and its outer wall undisturbed, but it is a great mistake to do so, for whilst in a very small percentage of cases, no ill result will follow, it will far more frequently happen that the wall gives way, either actually collapsing during the operation, or becoming so strained and cracked under the pressure of filling and pluggers as to crumble away very soon afterwards. It is therefore, far better ruthlessly to cut away this unsupported enamel, and one does so with less regret when one comes to realize that a very slight groove at the cervical edge is quite sufficient to ensure a good support for one's filling.

(3). A third reason for the failure of approximal fillings in incisors, lies in the omission on the part of many operators to shape the lingual margins of cavities in the most advantageous way.

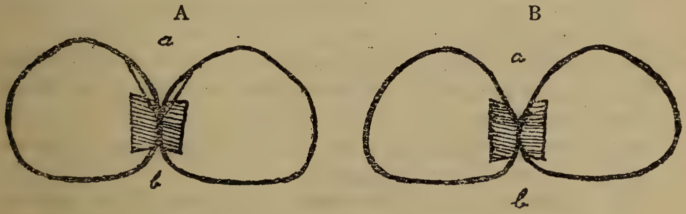

Fig. III. Diagrammatic Transverse Sections of Incisors.
A, method deprecated : lines indicate method advocated, shown in B.

I am convinced that many a good filling inserted with care and skill, fails to prevent further decay, because the lingual margins of cavities filled are allowed to come into contact instead of being well and permanently separated. The close contact of *flat* approximal surfaces, in weak teeth and unhealthy mouths is the cause of a great deal of decay, not in my opinion because of mutual pressure, but because of the presence of harmful fluids and bacteria retained constantly in position by capillary attraction. Therefore, I strongly advocate such a free cutting away of lingual walls, as will leave a wedge-shaped space between the teeth, the base of the wedge being towards the palate, and its edge towards the lips (Fig. III.) With such a space, capillary attraction may be defied. Except in the case of large cavities where a stroke or two breaks down the palatal wall, there is often a considerable amount of work to be expended with chisel and disc and file in the production of this triangular space, but the time and labour demanded are well spent, and are amply repaid by the satisfactory results obtained, results all the more satisfactory because no disfigurement of the teeth is produced by this mode of separation.

It is true that by thus freely cutting away the palatal margin, the lingual wall of a cavity is often reduced to a mere edge, but this need not affect the security of the filling, if only proper opposing points at cervical and cutting edges have been made ; and, indeed, in most cases any increase of difficulty experienced in the insertion of a filling on account of a narrow lingual wall, is abundantly compensated for by the increased freedom with which the cavity as a whole is reached, especially if the plan (the best as I think), is adopted of using the mirror largely in filling, and working from the palate towards the lips.

To turn now to the choice of filling materials in the treatment of approximal incisor cavities, there are a few observations that I should like to make under this head, and in doing so I shall take the several different kinds of filling *seriatim*.

To begin with plastics.

Gutta-Percha. This material I value highly as a permanent filling in two kinds of cavities—

(1) Cavities in the cementum, just beyond the margin of the enamel.

(2) Protected cavities, in teeth which are more or less loose.

(1) The cavities in the cementum to which I refer, rarely occur except in teeth whose immediate neighbours have been extracted. When, however, one or two front teeth have been lost, and artificial substitutes attached to a plate are worn, then the cementum of the remaining teeth, exposed more or less, as it soon comes to be in these cases, before long generally becomes carious. The decay is of the spreading variety, rarely extending far towards the pulp, but

creeping superficially round the neck, and presenting such a filmy, ill-defined margin that it is often a matter of some difficulty to determine where the decay ends and the sound tissue begins. In the treatment of this condition, after the thorough removal of all disease, and the obtaining of a slight undercut all round the cavity, I know of nothing which so satisfactorily replaces the lost tissue as gutta-percha. It is protected from wear by the adjoining artificial tooth, and if properly inserted, it not only permanently fills the cavity, but in quite a remarkable manner it appears to check the recurrence of decay in its neighbourhood in a way that gold and amalgam, however well inserted, frequently fail to do.

I do not attempt to explain this, I only attest it as a fact, in the observance of which I do but follow the experience of many.

(2) Gutta-percha I mentioned as being suitable for protected cavities in teeth which are more or less loose.

By the term "protected cavities" I here refer to those which are not exposed to the wear and tear of attrition. The protection may be afforded either by a sound lingual wall, or by an overlapping tooth, and if either of these protecting conditions are present, the use of gutta-percha is infinitely to be preferred to that of any other plastic, when the tooth to be filled is not firmly enough planted to make gold desirable.

In order to obtain the best results with gutta-percha, too much care cannot be exercised in making use of the best preparation obtainable, in softening the material in a proper manner, in using several small pieces rather than one large one, in having the cavity absolutely dry, and in trimming the margins of the filling with the greatest nicety. As to the best kind of gutta-percha, no doubt we all have our favourites, and I must say that I like Flagg's better than any other that I have tried. All gutta-percha for permanent fillings ought to be heated, not directly over or in a flame, but on an intervening plate of metal or porcelain.

Phosphate of zinc demands a few words. I am strongly of opinion that many operators set far too much store by this substance as a filling material. That it has its place as such I am quite ready to allow, indeed for certain purposes I think it is of great value, but its value does *not* lie in suitability for any approximal cavity that will allow of the insertion of a gold filling. I venture to affirm that few things in the way of malpractice have brought more discredit on operative dentistry, than the deliberate attempt on the part of many to use phosphate of zinc as a permanent filling for approximal cavities. The ease with which it can be inserted, and its frequent, (though by no means invariable), similarity in colour to the tooth that has to be filled, too often prove temptations strong enough to decide an operator to use phosphate where he ought to use gold. The patient, pleased by the use of white stopping,—so attractive in sound to the uninitiated—is not seldom left under the impression that permanent work has been done, and the discovery at a future date (generally not far distant), that this is not the case, leads naturally to such chagrin and disappointment as to make many a one lose all faith in the reality of conservative dentistry.

Where the value of phosphate of zinc *does* lie, is I think, in two kinds of cases,—

(1) In teeth so frail and broken down that the use of gold is out of the question, and the use of gutta-percha is contraindicated by the open, unprotected character of the cavities.

(2) In children's incisors, its use being avowedly a temporary measure.

In the first class of cases, phosphate fillings undoubtedly render good service by preserving for a considerable time teeth which would otherwise necessarily be consigned to the excising or extracting forceps.

Even more valuable than in these cases, is phosphate of zinc in the treatment of children's incisors, than which, I think you will all agree with me, we have few more difficult teeth to deal with. For a number of years, almost ever since the introduction of phosphates, I have practically discarded gold as a filling material for children's teeth, believing that I do my young patients better service by the use of a zinc stopping, which I replace at a later age by gold.

No doubt, taken by itself, it is a tiresome thing, both for patient and operator, to fill and then refill a cavity, but when one remembers that density of tooth structure, absence of acid mucus, and careful attention to cleanliness on the part of a patient, are conducive in the highest degree to the safety of a gold filling, and when it is remembered also that these conditions are found in a much more marked degree as a patient approaches adult life, than in the years of childhood, with these considerations in view, I think that the double operation is more than justified—that it is called for. There are exceptions, of course, where even in childhood one meets with teeth of fair density, with healthy mucous membrane, with diligent use of the tooth brush, and with ability on the patient to bear well the tedious nature of operations with gold, but in my experience these are rare exceptions.

In manipulating phosphate of zinc with a view to its lasting as long as possible, the fluid and powder should be thoroughly well mixed, and the mass should be used as stiff as possible. A thin steel matrix is often of great service in the treatment of large cavities, and in the trimming of fillings where the teeth stand very closely together, the ribbon-like spatula in Flagg's set of instruments is extremely convenient. The slightest film of oil on one's instrument greatly facilitates the shaping of the filling, preventing as it does the tiresome sticking of the soft mass to one's pluggers.

In connection with the use of phosphate of zinc for children's teeth, one important fact must be borne in mind. I refer to the caustic properties of the phosphoric acid which enters so largely into the composition of the filling. I believe that not a few pulps are destroyed by the use of phosphate fillings in cavities where the pulp lies close beneath the floor, and for my own part I never insert such a filling in a cavity of any depth, without carefully protecting the neighbourhood of the pulp with some resinous preparation such as carbolized resin or copal varnish.

Amalgams. I shall have something to say about amalgams in bicuspids and molars, but I can only speak deprecatingly of them in connection with incisor cavities. I must confess to scepticism in regard to the statements of manufacturers that amalgams may be used in front teeth without fear of discolouration; and as to the question of fee, I may be wrong, but I am strongly of opinion that there must be very few people, who can afford to come to a respectable dentist at all, who will be found unwilling to meet some additional expense if the alternatives to gold are fairly put before them—*i.e.*, amalgam with almost a certainty of more or less discolouration, or osteo with the absolute certainty of repeated renewal.

I suppose I need hardly say, that, under any circumstances, a good amalgam is preferable to a bad gold filling.

Gold. The welfare of our patients, and consequently the honour of our profession, demands the use of gold as unquestionably the best material for the great majority of approximal incisor cavities.

In dealing with very small cavities, the film of chalky enamel, so often surrounding them, having been scrupulously removed, and all sharp margins rounded, I generally find that cohesive gold is the most suitable to use, because one has scarcely room in these pin-head holes to manipulate non-cohesive foil conveniently. Owing to their smallness also, these minute cavities, in spite of a fair amount of separation, are generally extremely difficult and often impossible to fill without sharply curved pluggers, and on this account hand pressure is much superior here to the mallet.

Medium sized cavities, which allow of an undercut all round—the slighter the better, so long as it is just an undercut,—such cavities I fill throughout their principal extent with non-cohesive cylinders, or rope cut into short lengths, and finish cohesively. The cylinders I insert with one end touching the floor, and the other end projecting over the margin of the cavity, and each row of cylinders is thoroughly condensed before a further one is added.

In this way the filling is nearly brought up to the wall opposing the cervical edge, and then one or two cohesive cylinders are securely anchored between the gold already inserted and the remaining undercut. With such a starting point the remainder of the cavity is rapidly finished cohesively.

For the non-cohesive work in these cases I use variously modified foot pluggers, (Fig. IV.A), and finish, as in the small cavities, with sharp curves, or with the instrument (Fig. IV.B), which is particularly suitable for left hand cavities that can be easily approached from behind.

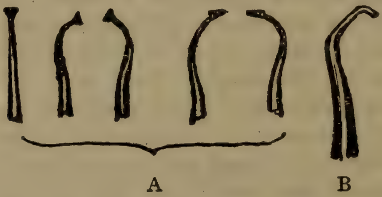

Fig. IV.

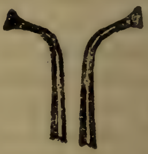

Fig. V.

For the early part of the filling, Wolrab's cylinders may be used, but a rather heavier make is generally preferable, such as Williams' 3c. For the cohesive portion I find there is nothing better than to start with Wolrab's cylinders and to finish with Williams' 3c, or with tape from 20 to 40 in thickness.

This method of filling has, I think, distinct advantages as compared either with purely cohesive, or purely non-cohesive work. In the latter it is extremely difficult to ensure the absolute security of one's final cylinders, and therefore of the whole plug; and in the former the operation is much longer, and there is more difficulty experienced in obtaining absolute contact of the filling with the walls.

In very large incisor cavities, where no opposing walls can be obtained, one has to fall back on purely cohesive work, and be thankful for it; but practically I find that there are very few even of the largest cavities which cannot be filled with perfect security and satisfaction by the method I have just been describing. Even in those cases where it is only the cervical portion of the lingual wall which can be made of any use in supporting non-cohesive gold, the latter may be so arranged as to be made perfectly secure between this limited lingual wall and a point halfway between the cervical and the cutting edges on the labial wall. Then, by wedging cohesive gold into the substance of that already inserted, and by the use of a retaining pit towards the cutting edge, a good filling may be rapidly and successfully completed.

Whenever projecting contour work is necessary, then, of course, cohesive work pure and simple is demanded, but for my own part I must say that I rarely feel called upon to do large contours in front teeth. Where the loss of tissue is slight, the space left by the insertion of a "flat" filling is as a rule advantageous rather than otherwise; and where the loss of tissue is great, I am of opinion that in nine cases out of ten one serves the interests of one's patient better—his comfort, appearance and pocket,—by the use of a well selected and well applied crown, than by building up masses of gold, which, however pleasing they may be to an operator as evidences of skilful workmanship, are as poor imitations of tooth substance as they are brilliant in their dazzling unsightliness.

Let me now direct your attention for a few minutes to the subject of bicuspid and molar cavities. In their preparation, the importance of scrupulously removing the film of chalky enamel so often surrounding the margins, and of avoiding a cervical edge composed of brittle enamel is just as great as it is in dealing with front teeth.

But in order to remove the chalky film referred to, from the approximal surfaces of molars and bicuspids, it is often necessary to make very free use of corundum discs. That being so, we are at once met by the difficult question as to the comparative value of contour fillings and permanent separations in the treatment of these teeth. Quite a different set of considerations are involved here to those which present themselves in connection with the question of contouring incisors.

With regard to the latter, I have already pointed out that a slight space between them is as a rule advantageous than otherwise, for whilst it does away with the dangers of capillary attraction, it is very seldom that food lodges in such spaces persistently. But with masticating teeth the case is different, for slight spaces between *them* are sure to become retentive receptacles of food, and there is consequently no middle course open to the operator between full contours and wide spaces

Broadly speaking it may be said, and I think without fear of contradiction, that wherever the shape and position of the teeth allow of it, the restoration of an unbroken grinding surface is highly desirable.

When the teeth to be dealt with stand close together, when they are long, particularly when constricted at the necks, and when much preliminary excision with discs has not been necessary in order to remove superficial decay from a surface otherwise sound, then contouring is nearly always the best cou se to take. On the other hand, when the teeth stand so apart to begin with, that the restoration of their original form will clearly not bring the approximal surfaces into contact, or when there is filmy decay running across the approximal surfaces in such a manner that it can only be properly removed by free disking,—under such circumstances wide separation is generally called for.

As however, I had the opportunity some time ago, of laying before this Society my views on the subject of permanent separation, I shall not go into it any further now, nor weary you with a repetition of what I said then, with respect to the extreme importance of shaping one's spaces judiciously, and with respect to the extreme folly of leaving such spaces with parallel sides, or worse still, with sides converging from the gum towards the crown.

I must conclude with a few words about filling materials in molar and bicuspid cavities.

Gutta-Percha is here serviceable, most serviceable under similar circumstances to those under which I advocated its use just now for incisor work,—*i.e.*, in cavities at the cervical edge,—especially on surfaces covered by plates and clasps.

Phosphate of Zinc. I can only say that I consider its use in these approximal cavities as even a greater mistake than its use in front teeth

Amalgams on the contrary, are in their right place when used as approximal fillings in frail bicuspids and molars, especially the latter.

Of late, since the appearance, of a paper by Mr. Hunt, of Yeovil, dwelling on the advantages of palladium amalgam, and pointing out means by which certain drawbacks to its use may be removed, I have made considerable use of this substance; and I am glad to have the opportunity of commending its merits to any who may not have tried it. Its colour, soon after insertion is jet black. It can, therefore, only be used for distal cavities, but it does not stain the tooth substance underlying it, it has been conclusively shown to have less shrinkage than any other amalgam, and it sets with such astonishing rapidity, that by the time one has trimmed one's filling into shape, it may be safely run over with an emery disc, or with a cane and pumice. This rapid hardening, admirable as it is in easily accessible positions, is not desirable in large and awkwardly placed cavities at the back of the mouth, and in these I prefer one of the copper amalgams—Flagg's, or Sullivan's, or Stewart's.

Where amalgam has to be used on conspicuous mesial surfaces, I find Flagg's contour preparation a very valuable material, especially when mixed rather dryer than the maker directs, and when before finishing, bibulous paper or tin are used as Bonwill directs, for taking up superfluous mercury

But in spite of the undoubted and indisputable value of amalgam, it is none the less true that gold still remains the material, with which, in approximate cavities even of molars and bicuspids,—given moderately strong walls and fair accessibility,—the most lasting fillings can be made.

Small, more or less spherical mesial cavities I fill in the same way as those of the same kind in incisors.

Rather larger defects on mesial surfaces which have to be approached from the crown, I make good practically in an identical manner with that I described as being my practice for medium sized incisor cavities, using first non-cohesive and then cohesive foil, getting a hold for the latter by grooves under the coronal margin.

In larger cavities still, I adopt practically the same method, except that I use heavier cohesive foil, up to 56, to finish with.

In distal cavities I use my gold in the same way as in mesial ones, but my pluggers vary, those roughly indicated in Fig. V. are what I like best. The same pair are also very useful in mesial cavities of molars—particularly lowers.

Whenever decay has extended as far as the gum, or where one's margins are composed of tissues structurally weak, my regular practice is to line the cervical edge with tin. This I do either with cylinders, or with tape, the latter making such a narrow line when the filling is completed as to be practically of no consequence as far as discolouration is concerned. So much so indeed, that I frequently use a thin layer of tin at the cervical edge of weak front teeth. Tin used thus undoubtedly leads to the preservation of more teeth than where gold is used alone, and the ease and thoroughness with which the cervical portions of these compound fillings can be trimmed and finished, are not the least advantages of this method.

In small cavities near the gum, on weak surfaces, a combination of gold and tin rolled up together, and used in the form of rope, makes an admirable filling.

For finishing the cervical portions of approximal gold fillings, I should like to mention as being extremely useful, some little instruments made by Hallam. With these, along with a knife-like trimmer, and an almost straight, narrow, thin burnisher, the difficulties of this part of one's work are reduced to a minimum.

I had hoped to be able to say something about the use of matrices, simple steel ribbon, Herbst's matrix, and the Ladmore Brunton, and also about the valuable aid sometimes rendered in large contour fillings by supports like the Howe screw post. But time forbids. I can only conclude by thanking you most warmly for the kind manner in which you have listened to what I have had to say.

British Journal of Dental Science.

LONDON, MAY 16th, 1892.

PATIENCE AND POLITENESS.

When the professional character of a physician, or family doctor, is being criticised, and a reference is made to the estimation in which he is held, it is not unusual to hear the remark, "Ah, he has such a good bed-side manner." It may be well to analyse what such a statement means, and perchance, apply the interpretation to ourselves, in the hope that some benefit may be derived. It would, then, to some extent, refer to the self-possession of the practitioner. He has, perhaps, been brought for the first time, in contact with his patient, and has to feel his way. He has not only to be at ease himself, but so far as may be possible, he will hope to engender the same comfortable state of mind in the patient. While punctilious in his conduct, he will nevertheless not omit, from a false shame, any enquiry which may be necessary from the urgency of the case, nor shrink from suggesting, in a proper manner, the advisability of carrying out a systematic examination. He is in fact, a polite man and an *honest* practitioner,—a gentleman ; and the result is that the patient will feel a relief that all that was requisite has been done, and that to make a thorough confidant of some one outside the family circle, was not, after all, such an ordeal as had been imagined. Now this instance of an exchange of sympathetic feeling may, we think, be applied to a very large extent, to the occasion when a patient takes a seat in a Dentist's chair. It is true the dentist's operating room is a different *locus* to the bed-chamber, and the confidences exchanged will not be of such an intimate nature; still the knowledge that a gentlemanly consideration has been brought to bear upon the question in hand, or the condition present, will bring a sense of relief to both parties concerned. There should be no obtrusive fussiness, no anxiety to unduly display an unlimited knowledge upon a thousand and one matters upon which the patient does not manifest the slightest interest, but at the same time there should be a readiness to impart necessary or wholesome information in a proper manner. Such behaviour is, or becomes, a characteristic mannerism with many practitioners, but there is room for fear that in large and heavy practices, these points are often overlooked in the hurry and stress of every day work, and the result upon the public mind is not in the direction of justifying a claim that dentistry should be considered amongst the polite professions. In connection with this matter, it sometimes occurs to us that much might be done during the student's hospital training, to cultivate such a habit as would, in after life, prove advantageous. It is interesting, though not surprising, to notice the difference which naturally obtains in individual students, as to the way patients are treated when attending hospital. In some cases it is safe to predict a large amount of success for the future practitioner, and the prophecy is warranted that he will have "such a good chair-side manner." In others, one feels that unless a more considerate habit is cultivated, a good operator will be placed at a serious disadvantage in his future career.

But of course it is not intended to suggest that this sympathetic bearing towards the patient can take the place of, or be a substitute for, other important qualifications, nor that the end to be aimed at is success simply from a financial point of view. On the contrary, sound knowledge, skilful ability, and *absolute honesty*, are all requisite in the first place; but, from our aspect, these attributes should be cemented together, and surrounded by, the politeness and patience to which we have above alluded, and then we may fairly hope for a wider recognition that the latest development of the dental surgeon justifies the claim that he belongs to a liberal profession. If we were arguing that it *paid* to be polite, we should only have to refer to some of those sad examples of men, who, generally ignorant and scarcely honest, give their victims a display of assumed sympathy, and, with a considerate demeanour, covering a callous commercial instinct, and with but little else, are yet able to "run a large concern," which is quite a different thing from a professional practice.

It is quite evident that there is, and for some time to come must be, a high class and a low class of dentist; all one would urge is that those who see that the practice of skilled dental surgery is for the common benefit, should also see that it is carried on upon professional lines and in a professional spirit.

It seems hard to preach patience to the rising generation of practitioners, in the face of much that is going on around, and still harder to the anxious father who hesitates as to the advisability of entering his son for a professional career; but if there is any half-heartedness it would be wiser, and certainly more honest, to choose some other calling. In spite of suggestions to the contrary, which are scarcely worth notice, so transparent are the motives, we still believe that a continuance of scientific training of practitioners, as servants of the public, will produce good results; and as the State has not yet provided free hospital training for the medical and dental student, the expense must necessarily be borne, at first hand, by the individual. And we are strongly of opinion that the large sums of money spent by fathers upon sons (in order to make them accomplished practitioners) are not to be regarded (as some suggest) as absolutely wasted. The public, fortunately for itself, does not think so, and there is evidence abroad to show that a larger and wider view, as to the results of scientific as opposed to empirical methods, is being taken, and that the recipients of the benefits received are willing to pay a share of the interest on the money invested in the production of scientific practitioners. As Education, itself, becomes more of a science, people will be still more ready to recognise the advantage of employing and paying for the work of brain, as well as of hand, and this, too, from a practical and economic point of view.

It is, then, by means of patience and politeness that future dental practitioners will be enabled to present, to an enlightened public, the results of scientific investigation and modes of practice.

THE DENTISTS' ACT. The *Chemist and Druggist* charges dental scribes with hungering after a monopoly of everything dental, and ourselves with ignorance of the Dentists' Act. We plead not guilty. The question to be presented in a Court for interpretation is:—what titles, besides that of "dentist," assumed by an unregistered man can be held to imply that he is a person specially qualified to practise dentistry. Meanwhile, the *Chemist and Druggist* has liberty to consider the difference between a suggestion that the unregistered man is a "dentist," or that he is a "person specially qualified to practise dentistry." At the present moment, no unregistered man ventures to say he is a dentist, any more than that he is specially qualified to practise dentistry. Practically, therefore, these two things are equal, and it would seem possible that the use of a title implying the one might be held, legally, to apply equally to the other.

PUBLIC HEALTH IN CHICAGO.—In the interests of those who intend to visit the Exhibition next year, we hope the reports of the existence of typhoid fever are untrue, or at least exaggerated. It seems the Commissioner of the Health Department took fifteen certificates of death from typhoid fever at haphazard and sent medical men to investigate the actual cause of death. They reported that only two were really due to typhoid, the other thirteen being ascribed to various other causes, ranging from miscarriage to consumption! This would seem to indicate that there was room for some improvement in the diagnostic department of the family attendants.

Epithelioma of the Lip.—The occurrence of so large a proportion of these cases in the lower lip of men, is sometimes ascribed to the habit of smoking, but the escape of the upper lip is more difficult to explain, although perhaps there is not the same amount of pressure and irritation. Mr. Roger Williams has recently recorded statistics which show the disproportion under both these heads. Out of 329 epitheliomata of the lower lip, 3, only, occurred in women. The same list of cases from which these were taken, included only 3 epitheliomata of the upper lip, and of these 2 occurred in women.

Junker's Chloroform Inhaler.—Although chloroform should be but rarely used for producing general anæsthesia in dental operations, there are occasions upon which its employment may be justifiable, and we are therefore interested in a modificiation of Junker's inhaler which has been specially designed by Dr. Frederick Hewitt in order to prevent certain accidents which have from time to time occurred with the ordinary apparatus. Generally, air is pumped to the bottom of a bottle containing chloroform, by means of a hand-bellows and india-rubber and metal tubes, and, after traversing the fluid, escapes from the mouth of the bottle by a second, but shorter tube, connected with a face-piece, by an india rubber tube. In mouth or nose operations anæsthesia is maintained by removing the face-piece and using a ben termination, which may be passed into the buccal or nasal cavity. In Dr. Hewitt's ingenious contrivance the afferent air tube is made with a much larger diameter so that there is also room inside to allow of the efferent tube passing backwards within it, the currents of air thus traversing opposite directions. The efferent tube finally escapes from the reservoir of the hand-bellows and is then continued to the face-piece. In this way there is no possibility of the tubes getting transposed by accident, and, as the apparatus is suspended round the anæsthetist's neck, leakage of chloroform to the face-piece, in consequence of the bottle becoming tilted, is impossible.

Dentinal Bone. In connection with the recent investigations on the structure and formation of dentine, it is interesting to notice the description, given by Prof. Stewart in his lectures at the College of Surgeons, of the structure of bone as found in some of the lower vertebrates. In the common garfish, the bones of the head, at all events, showed a complete absence of lacunæ and their canaliculi, the tissue having a character resembling dentine, due to branching tubes extending inwards from the surface. In the bones of the sea-horse, similar tubules were to be found radiating from all the vessel-containing channels, and as these were much finer than in the former case, the resemblance to dentine became exceedingly close. Again, a peculiar feature was pointed out in the ornithorhyncus—namely, that although lacunæ with their canaliculi were present, yet many of the Haversian canals showed long tubules directly radiating into the surrounding matrix, reminding one of that dentine-like structure already referred to as an aberrant feature in the bones of certain fish.

A Distinguished Patient.—It appears from the Daily press, that a considerable commotion has occurred throughout the country, in consequence of bad reports concerning the health of the horse holding the position of Derby favourite. There was much relief expressed when it was stated that the illness was in connection with his teeth. Professor Lœffler, the celebrated horse-dentist, had been summoned, and great hopes were expressed that matters would soon be right. As, however, the report goes on to say that the tooth trouble is complicated with sore throat, we may perhaps have further bulletins. A later statement refers to poison.

The race for the Derby is, we believe, confined to 3-year olds, and at this age the permanent central incisors are in contact, but the temporary laterals are not yet shed. There is also a transition going on at the back of the mouth, for between the 2nd and 3rd years the first and second temporary molars are removed, and thus eight premolars are erupted. Sometimes the second in position is cut before the first, and it is not difficult to understand that if there were some trouble in connection with the undue retention of a temporary tooth, the horse might get "off his feed" and occasion his industrious "backers" some dismay.

UNLUCKY TEETH.—Amongst other instances of credulity and superstition in Ireland, mentioned in an article in *Chambers' Journal*, appeared the following :—A young blacksmith, whose wife had presented him with their first baby, was horrified to find that the infant had been born with teeth. So unusual an event must be unlucky ; so the poor baby's teeth were drawn by the unskilled hand of the blacksmith. The baby died : and the mother, shocked and grieved by the scene, died soon afterwards. "But sure, he'd never have had luck or grace if them unlucky teeth hadn't been dhrew."

Abstracts of British & Foreign Journals.

LOCAL ANÆSTHESIA IN THE EXTRACTION OF TEETH.

By Luigi Ribolla-Nicodemi.

The author commenced the trial of cocaine when it came into use as a local anæsthetic at the end of 1883, and employed it on a large scale for the extraction of teeth in his dental clinic. He began with a strength of 25 per cent., and then reduced it to 20, 15, and at last 5 per cent. dissolved in distilled water. At first it was applied to the surface of the mucous membrane, but afterwards injected by means of a Pravaz syringe, from 1 to 6 centigrammes of the alkaloid being gradually introduced at a time. He was prepared to publish the results of his experiments when Dr. Viau's famous pamphlet came to light, which caused him to hesitate, the more so in as much as it was followed by a veritable inundation of writings of all kinds, repeating the same thing. In spite of the general enthusiasm, the author was not satisfied with his results, and in some 2,000 injections into the gum, met with sufficient cases of serious inconvenience to make him gradually reduce the percentage of cocaine, until he injected in every case 150 mmc. of a one-and-a-half per cent. solution, as in the accompanying formula.

Hydrochlorate of cocaine, gr. 1·50.
Distilled water, gr. 100.

Whilst this proportion was not large enough generally, to bring about the phenomena of intoxication, neither was it always enough to obtain a sufficient local anæsthesia.

He then proceeds to explain his new method of obtaining a deep local anæsthesia, by using chloride of ethyl, which is even better than increasing the dose of cocaine alone. Two cases, however, are first recorded in which unpleasant effects followed the employment of cocaine. In the first, a gentleman of sound physical constitution presented himself, suffering from dental periostitis in connection with the right lower second molar, which was very carious, and which he wished extracted painlessly. The Pravaz syringe was disinfected with a 10 per cent. solution of creolin, and then a cubic centimetre of a solution of cocaine was injected, half on the lingual, and half on the buccal aspect, in the direction of the axis of the root of the tooth. After about ten minutes there was anæsthesia, and the tooth was easily removed without any complication. The patient only felt a slight, insignificant pain, and there were none of the general symptoms of cocaine poisoning. Although there was a slight acceleration of the cardiac impulse, there was nothing, in fact, to excite attention or raise suspicion. After a few hours, however, the patient began to experience a little difficulty in swallowing, and this became so great that he could not enjoy any food. This intense dysphagia lasted quite three days and was followed by serious mental disturbance.

In the second case a lady of lymphatic temperament, wished the root of the first left upper bicuspid removed. The syringe was disinfected, and a cubic centimetre of a solution of Merck's cocaine, 5 per cent., was injected in the direction of the root, half on the palatine, and half on the external aspect. After a few moments an extreme hyperæsthesia was manifested on that side, so much so, that the lady could not bear the pressure of her own lip, and all idea of operating had to be given up. No disturbance of either the central or peripheral nervous system was noted. Local sedative medicines were not successful, and, still worse, on the next day a deep ulcer appeared on the palate with softening of that part of the mucous membrane invaded by the liquid injected. This state of things was prolonged for some months, in spite of intelligent treatment on the part of a careful doctor.

After such experiences, the author was unwilling to trust to such an uncertain agent, although at the same time he did not wish to give up the benefits of its anæsthetic action. When Dr. Redard, of Geneva, called the attention of the profession to the use of chloride of ethyl, the author obtained some of the special phials, but after using it in about 100 cases, was obliged to confess that the effect was not always constant. If it almost succeeded in the painless extraction of teeth with one fang, or which were a little loose, it was not so in the case of firm ones, bicuspids and molars. Not content with his own personal experience, however, he induced several of his colleagues in Palermo and in Pisa to make extended trial with it, but the result has been, up to now, very slightly satisfactory, if not altogether negative.

In view then, of the inefficacy of chloride of ethyl, and the treachery of cocaine, when used in large enough doses to obtain deep anæsthesia, the author thought he could profit by using both agents in the following manner. Under the mucous membrane, on both sides of the tooth to be extracted, he injects 1½ cubic centimetres of a one-and-a-half per cent. cocaine solution, and after four or five minutes projects a jet of the chloride of ethyl upon the gum over the root of the tooth from the inside or outside, according to circumstances. The freezing is prolonged one or two minutes, and then the tooth is extracted. The details are given of twenty cases which he has treated satisfactorily by this method up to the present. The following are the conclusions drawn :—

1. That to obtain complete local insensibility by the exclusive use of cocaine in the extraction of a tooth, it is necessary to inject from 3 to 5 centigrammes, a dose often followed by some symptoms of poisoning, sometimes sufficiently serious to make one prefer the pain of the extraction to the dangerous disturbance which often follows it.

2. That the use of chloride of ethyl, pure and simple, although it may be of valuable help in greatly mitigating the pain, is nevertheless not enough to completely abolish it, except in those teeth with one fang, or not very firmly implanted.

3. That the combined action of a medium dose of cocaine and chloride together is successful in the majority of cases, even if difficult and tiresome. It is necessary, however, to notice that, in order to get deep anæsthesia, the highest intensity of the cocaine insensibility must coincide with that of the ethyl. In spite of the present condition of things, the dentist cannot yet conscientiously cry "Eureka." He cannot be shown to have found a means, which is at the same time incontestably efficacious, and absolutely harmless.

L' Odontologia.

IMPROVED GUTTA-PERCHA FILLINGS.

By W. Storer How, D.D.S.

Notwithstanding the fact that gutta-percha compositions have been many years in general use by dentists for filling carious teeth, the disregard of suitable methods of manipulating these materials in common practice, is a matter for serious reflection. At one stage of the operation, a prevalent custom is to transfix on a plugger-point a pellet of gutta-percha, and hold it over or in the flame of the annealing lamp, until the pellet is guessed to be sufficiently softened for use. The frequent result is a more or less burned pellet and an imperfect filling. Yet such is the inherent excellence of the thus abused plastic material that the tooth will probably be preserved long enough to encourage the reckless operator in a continuance of this barbaric process, although it is more than likely that he will be heard from in some dental Society meeting, discussing the subject of "Gutta-percha as a temporary dental stopping." The fact is, that when properly placed, a gutta-percha filling is not only permanently protective of its territory in the tooth under ordinary circumstances, but is the most comfortable and compatible material for the purpose that has thus far been employed by the profession. The present paper has been prepared with the object of directing renewed attention to the subject from a strictly scientific and utilitarian point of view, even at the risk of saying some things which are already well known, although but seldom put in practice. Certain classes of cavities, especially those of a compound coronal character, are excluded from this consideration, as requiring material more capable of resisting the forces of mastication than is gutta-percha in most of its compounds. A recent preparation, however, possesses a density and toughness which admit of employment in the coronal cavities of deciduous molars, and such permanent molars and bicuspids as are not subject to hard usage. Leaving out of view the excepted classes, most other carious dental cavities may be well, and in many cases permanently, filled with a good gutta-percha compound. Many approximal cavities may well be filled with gutta-percha, and those where a gold filling would show through the thin enamel front, can be better filled with suitable gutta-percha, care being taken to have the enamel margin with a squarely defined angle at its surface border. Certain cervico-labial or buccal cavities, admit of permanent gutta-percha fillings, but of course, due attention must be given to the retention of the fillings by enlarging the interior of the cavity if necessary. After suitably preparing the cavity, it should be made as dry as possible and kept so. For conveniently and properly softening pellets of gutta-percha, a thermoscopic heater has been made of steatite, because of its heat-retaining property and the desirable physical qualities of its surface. The handle is of wood, and at the opposite end, in the centre of a circular depression, is a small disc of metal, which is fusible at 212 F. On the heater near the metal, a suitable number of gutta-percha pellets are placed, and the heater is held over the flame of the annealing lamp or burner, until the fusible metal melts, when the apparatus is placed on a piece of cardboard and the gutta-percha will be found to be properly softened. The steatite plaque retains the heat long enough for an ordinary operation, but if the metal meantime loses its fluidity and so indicates a lowering of the standard heat, it may be quickly restored by a moment's holding of the heater over the flame, which will again fuse the metal. A ready graduation of temperature can also be produced to suit each of the various gutta-perchas at present in use, those pellets placed near the disc will be at the heat of about 208° F, but others arranged further off may be at 200°, 194°, and 180° respectively according to their distance. As a suitable indicator for a high-heat stopping, a button of metal fusing at 230° is provided instead of the disc, which is first melted and poured out, for the heater cavity is so undercut, that when cold, the metal cannot be shaken out. Hot air should be blown into the previously prepared and dried tooth cavity, and then, making sure the heater metal is melted, a pellet or group of pellets, sufficient to a little more than fill the cavity, should be picked up with a suitable broad and cold instrument and forced into the cavity by a quick firm rocking pressure, as if it were sought to take an impression. Then the instrument should be dipped into ice-water, wiped dry, and held firmly against the filling for one or two minutes when the surplus can be removed with a keen-edged thin blade, working from the centre obliquely toward the margin, and taking care that the filling shall be flush with the cavity-margin at every point.

There is good reason for the belief that the common mode of successively introducing small pieces of imperfectly softened gutta-percha into a comparatively cold cavity, and employing instrument points more or less heated for packing the cooled plastic against one side of the cavity after the other, must in the nature of the case result in a leaky filling, such as gutta-percha is commonly said to make, whereas the defect is due not to the material, but to its inconsiderate manipulator.

The author carried out a series of experiments with porcelain teeth in which cavities were cut previous to baking. They were filled with gutta-percha, and when quite cool, they were pared quite flush and kept several days in dilute aniline ink. When the fillings were removed, there was no trace of colour on the walls of the cavity or on the fillings. The only exceptions were in cases in which the margins were rounded and the fillings left with a feather edge. It is better to pare the filling below enamel slopes than to leave it overlapping. For a final finish, a rapidly revolved lightly-touching cuttle-fish paper disk should be used, followed by a wisp of bibulous paper or a piece of tape wet with chloro-percha, applied for an instant to glare the surface of the filling.

If the floor of the cavity closely approximates the pulp, it should be protected by a layer of cement or low-heat gutta-percha, and a high-heat material be super-imposed. In large cavities, with frail walls, one or other of these methods is also preferable, but a new material mentioned is so dense and hard that in cases where the walls are strong, it may be used, even when required to resist some masticatory action. This high-heat gutta-percha is especially adapted for filling the large cavities in pulpless teeth, which are to be put on probation to determine whether or not the root-fillings are efficient. It is also hard enough to form a firm base for an inlay of metal or porcelain. In all cases, the continued dryness of the work until completed is necessary, but in difficult cases the paring process must be left to follow the unavoidable influx of moisture.

The heater mentioned is useful for setting artificial crowns, inlays, and metal facings or caps, which may be placed on it and so brought to the precise temperature of the softened gutta-percha with which they are to be mounted. In fact, it is advantageous to thus warm a crown or a bridge, prior to setting it with cement.

The Dental Cosmos.

Profuse Hemorrhage.—Never give stimulants in a case of profuse hemorrhage. The faint feeling, or irresistible inclination to lie down, is Nature's own method of circumventing the danger, by quieting the circulation and lessening the expulsive force of the heart, thus favouring the formation of clot at the site of injury. *Clinique.*

A NEW OXYPHOSPHATE FOR CROWN SETTING.

By W. B. Ames, D.D.S., Chicago.

After an extensive series of carefully recorded experiments, the author arrived at the conclusion that a very limited number of the metallic oxides have the property of forming a cement in combination with phosphoric acid and water. The oxides of zinc, copper and mercury only, have this property according to experiments. The salts of mercury are undesirable for use in the mouth ; they are so potent for evil as well as for good. The only addition, therefore, the author has been able to make to the cement family is the higher oxide of copper. The red or cuprous oxide forms a cement with phosphoric acid and water which has good working qualities, but shrinks badly in setting, lacks strength, and becomes friable with crystallization. The black or cupric oxide forms with phosphoric acid and water, in proper proportions, a cement which has desirable working qualities, and a hardness and stability after crystalization which gives promise of its being a valuable addition to our list of materials for use in filling cavities and the attachment of crowns and bridges. The most valuable property is the ability to use a large proportion of oxide in the mixture, without hurrying the crystallization of the mass. With an unusually large proportion of oxide, the crystallization is sufficiently slow to allow of thorough mixing and deliberate handling while filling a cavity, or setting a crown or bridge. It is peculiar in that it retains its plasticity for an unusually long time upon a cold glass slab, but crystallizes rapidly under the effects of the warmth of the body. While it gives plenty of time for manipulation, it hardens rapidly after the process has once commenced, and is harder in a few minutes after being placed in the mouth, than is usual with oxy-phosphate of zinc. The crystallization of this cement, when the proper proportion of ingredients has been used, seems more perfect than that of any of the zinc oxides which the author has ever seen, and there is a flint-like hardness.

There is undoubtedly, a powerful antiseptic influence exerted by the cement while in the plastic state, as there is a small amount of phosphate of copper formed during the mixing, which is soluble in the free phosphoric acid of the plastic cement, but insoluble in the saliva after the crystallization has taken place.

In as much as phosphoric acid attacks the more electro positive metals readily, it is naturally suggested that we should be careful about using an unplated steel spatula in the mixing of oxy-phosphates. If the phosphoric acid solution contains the proper proportion of water for best crystalization with the oxide used, this proportion may be modified lo a detrimental extent by the combination of a portion of the acid with the metal of the spatula. A spatula of some of the more negative metals, or a steel spatula plated with negative metal is a more sensible instrument to use than one of steel only. The ivory spatula would notbe considerrd as preferable to steel, but one of wood might in this connection be practicable, but for many reasons is inferior to thoroughly plated steel. A three inch druggist's spatula immersed in a strong solution of sulphate of copper, will become coated or plated with copper in such a manner as to make it a practi. cal spatula for mixing this cement. This spatula should not be used for mixing any white cement, as it is difficult to so thoroughly remove the black cement, that the other will not receive a decided tinge of the colour. A glass slab from four to six inches square should be used.

Dental Register.

RECURRING DISLOCATION OF LOWER JAW; TREATMENT BY OPERATION.

By F. Marsh, F.R.C.S.

The mechanism of dislocation is essentially the same whether the displacement is unilateral or bilateral. When the mouth is opened, the condyle, with the interarticular cartilage, moves forward out of the glenoid cavity, and rests against the convex root of the zygoma; if downward force is now applied to the jaw, or if the external pterygoid suddenly contracts, the condyle is carried over the convex root, into the zygomatic fossa, and the jaw is drawn forwards and upwards by the masseter, internal pterygoid, and temporal muscles. The capsular and other ligaments are stretched, but are seldom ruptured.

It would seem from the anatomical arrangement of the joint that normally the forward movement of the interarticular fibrocartilage is limited by its attachment to the capsule, and that the condyle is prevented from passing on to the summit of the convex root, chiefly by the external lateral ligament. In some cases the force producing the dislocation is undoubtedly sufficient to overcome both these restraining influences, but in others it is probable that the ligaments have been previously weakened by some general debilitating cause —illness, childbirth, etc.—and that both the cartilage and condyle move more forward than usual, and hence become displaced by comparatively slight muscular or other force. It is noteworthy that most of the cases referred to by various writers have occurred in women.

Dislocation having once occurred, there is a decided tendency to recurrence, owing both to the stretching of the ligaments at the time of the accident and to the want of precaution to keep the joint at rest for a sufficiently long period after reduction. The time for limiting movements advised in most of the current textbooks varies from a few days to a week or two, and is manifestly insufficient for the full repair of the damaged tissues and the contraction of the ligaments.

With each recurrence the liability to dislocation becomes more marked, and the joint may become so insecure as to be a constant source of trouble and annoyance. As a rule, but little pain is caused after the first few displacements, and the amount of inconvenience will depend upon the facility with which reduction can be effected; easy reduction by the patient representing the minimum, difficult reduction by a surgeon the maximum.

Hitherto the treatment of recurring dislocation has been palliative only. An elastic bandage or some similar support for the chin is recommended, and the patient is cautioned against opening the mouth too widely. Even if this advice is followed—which it seldom is for any length of time—it is almost certain that in some moment of forgetfulness an incautious movement will reproduce the displacement and discourage the patient from wearing a restraining apparatus, which is always irksome, and certainly not becoming to either sex. In these cases, therefore, palliative treatment is inefficient and unsatisfactory.

The history of the following case will best explain a method of operation the aim of which is to check the forward movement of the interarticular cartilage, to prevent the condyle from reaching the summit of the convex root of the zygoma, and at the same time to interfere as little as possible with the normal range of movement of the jaw.

The author gives the report of a case of bilateral dislocation, in a woman, which was so troublesome, by constan recurrence as to necessitate operative interference. The left temporo-maxillary articulation was exposed, the capsule opened and the cartilage found to be exceedingly loosely attached. A catgut suture was passed through the periosteal attachment of the capsule to the zygoma and through the margin of the cartilage; but in tying it in the deep and narrow wound it cut through the cartilage; fine silver wire was substituted, twisted and cut off short. A second suture was then passed through the external lateral ligament and through the periosteal attachment of the capsule, as far back as possible, so as to make a fold. The wound was closed; it healed by primary union, and the patient returned home in twelve days, wearing an elastic bandage and being limited to slop diet. After leaving off the bandage, in two months, the right condyle soon became dislocated, and this occurred so frequently that a second operation was performed. Since this there has been no recurrence of dislocation, and no trouble whatever has been experienced from the buried sutures, while the cicatrices are hardly visible even on close inspection. She can open her mouth widely, or gape without fear, and can eat anything.

The operation, though apparently simple, is not a very easy one to perform. The wound must be limited in length because of the anatomical surroundings; the tissues cut through are very vascular, and it is difficult both to pass the suture, and to tie it sufficiently tight without cutting through the fibro cartilage. On this latter account aseptic silk or tendon will probably be found the most suitable material for the suture. In view of the possibility of suppurative arthritis and subsequent ankylosis, it is advisable to operate on one side at a time. The second operation should preferably take place soon after the healing of the first wound, and before the elastic bandage is discarded.

A sufficient length of time has now elapsed—over eighteen months since the second operation—to establish beyond doubt the permanent character of the result obtained by this method of treatment, the success of which has in this instance been so complete as to justify its employment in other similar cases.

British Medical Journal.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting held April 4th, 1892. Mr. David Hepburn, L.D.S., *Vice-President*, in the chair.

The chairman expressed his regret that their President was unable to take the Chair as usual, owing to a recurrence of influenza, which he hoped was not very serious.

The minutes of the previous meeting having been read and confirmed,

Messrs. William Palethorpe, 83, Edmund Street, Birmingham; Fred. H. Ellwood, Granville House, Redhill: Edward Thos. Cooksey, 26 Marine Parade, Worthing, having signed Obligation Forms, were duly declared Members.

The following gentlemen signed the Obligation Book, and were formally admitted as Members:—Mr. Percy L. Webster, Mr. Harry G. Forsyth, Mr. Walter S. Holford, Mr. Montagu F. Hopson, Mr. George Hern.

The LIBRARIAN (Mr. ASHLEY GIBBINGS) announced the receipt of the following books to the library: "On the Modification of Organisms," by David Syme; *Proceedings of the Royal Institution and Proceedings of the Royal Society, Transactions of the Grant College Medical Society*, February to December, 1891.

Mr. West presented several curious specimens of old dental instruments to the Society's collection, consisting of a pair of universal molar forceps and three elevators. He said the appearance of these instruments was so remarkable that they made one think there must have been "giants in those days."

Mr. S. J. HUTCHINSON being called upon for a Casual Communication, said that he had met with a very interesting case in University College Hospital, the circumstances connected with it being of rather an unusual nature. It was a case of necrosis and fracture of the lower jaw, but he was unable to give a very definite explanation of the accident. The medical notes of the case also were not very complete, so that he would be unable to give them the full details of the case in the manner he should like to have done. One evening in February he was asked to see a patient in the wards of the Hospital; he found him in a comatose condition, with his face and jaw done up in a bandage; there was considerable swelling on the left side of the lower jaw, and digital examination showed that very distinct crepitus existed. He decided to leave the case in the hands of the medical staff until he should be called in again. A few days later the patient died. He (Mr. Hutchinson) then endeavoured to gain some history of the case, and some notes were given him from which it appeared that Mr. P. was a new patient of the dentist to whom he first applied, so he did not know much about him. He first came about ten days before the eventful visit, when he complained of pain in the region of the wisdom tooth. The face was much swollen, and on looking into the mouth, it was found there was a partially impacted wisdom tooth, with one cusp peeping through the gum, the second lower molar loosened, and it was decided that there was an abscess caused by the irritation from the pressure of the wisdom tooth. He had only had pain for about a fortnight; he could hardly open his mouth, so that it was impossible to get to the wisdom tooth to remove it. It was decided to extract the second molar; poppy head fomentations were ordered and the patient told to come back if he did not get relief. He came back on the 9th, when the wisdom tooth was removed. He again came on the 10th into the dentist's room and tried to speak, but almost directly fell down in a fit; a doctor was sent for, who came immediately. The first stage of the fit was very long and the spasms very severe, he partially recovered consciousness after this fit, but went into a second when they tried to give him bromide; he had four fits in succession, the fourth being by far the worst as they had to resort to artificial respiration; calomel was placed on the tongue, and on the arrival of another doctor he injected bromide per rectum. He was in the dentist's room from about 4.15 p.m. till about 8.30 p.m., and never recovered consciousness. He was then removed to the hospital.

Clinical Notes.—"On admission into University College Hospital, the patient kept his mouth constantly opened, there was considerable swelling over the angle of the jaw, which was fairly soft. On pushing up the jaw there was considerable crepitus, and the movement was very jerky. Distinct movement could be obtained between the body and ramus on the left side of the jaw. On putting the finger into the mouth in the situation of the last molar tooth a hole could be felt with some loose bone in it, the ramus was partly bare along its outer border, and there was a good deal of thickening about this spot ; on the outer and inner side the fracture appeared to be transverse. When the patient opened his mouth, he seemed to dislocate the right condyle and to be unable to close his mouth himself.

"The post-mortem examination showed :—On dissecting out the lower jaw the bone came out easily with the abscess cavity, greenish in colour, one-eighth inch thick on the left side, holding it together. When the wall of the abscess was cut through, much foul pus escaped, the fracture was then seen extending from the last molar tooth to the angle of the jaw. The bone on either side, for nearly half-an-inch, was white, and stripped of its periosteum, and two small fragments were seen, one part of the outer wall of the alveolus, black in colour, the other part below it. The kidneys were soft and enlarged, cysted on the surface, the capsule being adherent. There was softening of the lower part of the spinal cord. Heart normal. Lungs congested. Brain, excess of fluid in ventricles on the surface.

"Subsequent enquiry elicited that the patient had been treated for tabes dorsalis for three years. His chief symptoms being loss of knee jerk and gastric crises ; for this he had been given hypodermic injections of morphia, and on his own account had taken chloral up to 90 gr. per diem. He also had some epileptic fits three years ago, but his urine had never been examined.

"About five years ago he contracted syphilis which affected his tongue, and this became fixed to the floor of his mouth, his speech becoming very thick. Two weeks before admission, he went to a dental surgeon, having an alveolar abscess; and his present illness commenced at the dental surgeon's house on February 10th. On admission to University College Hospital, patient had fits every few minutes, his eyes rolled upwards, he had chronic movements of both his arms and general struggling, during the first part of his fit conjunctival reflex was lost. The tonic stage was not marked, he neither bit his tongue nor passed urine or fæces, he was comatose. His urine contained a fair amount of albumen. His face was puffy, no œdema elsewhere. While he lived, his condition did not alter much, except that the fits became less frequent, and just before death his temperature rose to 104 F."

The CHAIRMAN remarked that it seemed to him to be a case of very peculiar interest, and he thought it very advisable that when possible these cases should be fully reported in their *Transactions*. The apparent injury by the dentist when some troublesome circumstances follow an extraction, was a question of very great importance. Allowance was rarely made for the condition of the patient, and they knew that when patients presented themselves suffering with necrosis or other disease of the jaw, possibly some of the jaw would be brought away with the extracted tooth, when it was not the fault of the dentist. It was therefore important that such cases should be recorded as fully possible. With regard to the possibilities of the fracture as having occurred during the spasmodic contraction of the muscles, if they had the specimen they could then see the line of fracture and the portion of bone burrowed into by the abscess, but without the specimen they could come to no conclusion. From Mr. Hutchinson's description it seemed to him that the spasms were almost like tetanic spasms.

Mr. C. S. TOMES wished to ask what was the cause of death?

Mr. IONIDES, House Physician at University College Hospital, being present later in the evening, stated that when the patient came to the hospital they had no history and the fits were those of typical epilepsy. An examination of the urine indicated albuminuria, and the man was suffering from Bright's disease. He had been under treatment for locomotor ataxy, and had also had very bad syphilis, for which he had been treated with iodide of potassium without result. The immediate cause of death was uræmia.

Mr. M. Y. WOOLF then narrated the following case. He said in Nov., 1888, A. V. H. (9th Lancers, Ireland) received a blow in the mouth from the kick of a horse, which cut deeply into the substance of the left cheek. The wound extended from a point just above and in front of the angle of the jaw in an oblique direction downwards and forwards, approaching the median line, where it curved upwards, severing the lower lip about a quarter of an inch to the left side, and was continued upwards, severing also the upper lip, and terminated at the situation of the anterior nasal spine. The nose, as well as being bent flat over to the left side, as far as the cartilaginous portion was concerned, might have had the bridge broken, as a slight thickening existed at that point, which the patient declared was not there previously. Two or three teeth were knocked out at the time. Almost immediately after the accident, the staff surgeon stitched up the wound and advised rinsing the mouth with Condy's Fluid. In spite of treatment there was at times considerable oozing of pus, either directly into the mouth or the pharynx. This state of things continued until he obtained leave of absence and came to London for further advice. The patient had some time previously consulted a dentist in the north of England, who suggested his waiting until the suppuration had ceased, and then having a plate made to fill up the gap caused by the loss of the four teeth. When he presented himself at the National Dental Hospital on Sept. 11th, 1891 (three years after the accident), Mr. Woolf examined his mouth and found the left upper lateral and canine and both bicuspids were missing. The lower canine on the same side was fractured obliquely at the expense of the distal half of the crown, and the first and second bicuspids were represented only by their roots firmly embedded in their sockets, and almost covered by the gum. Owing to the contraction of the soft tissues subsequent to the accident, the tension of the muscles on the left side was so great that it required considerable pressure to enable one to pass a mouth mirror along the sulcus, especially in the upper jaw. This condition also interfered with the taking of an impression, inasmuch as it had to be done with the mouth partly closed. A closer examination revealed an opening leading directly into the antrum which was almost large enough to admit the tip of the little finger, and situated high up in the sulcus in a position corresponding to the root of the second bicuspid. The left central was extremely loose, and appeared to be merely supported by soft tissue, which presented the appearances commonly seen in cases of necrosis. It would be interesting to learn whether it was the opinion of the Society that this central, which was shown, was covered with tartar, or with adherent necrosed alveolar process. The right upper central was loose, but although dead like its neighbour, was more firmly attached. All the teeth, but particularly those on the left side of the mouth, were thickly covered with tartar. Mr. Woolf came to the conclusion that the patient presented all the symptoms of a foreign body in the antrum, the presence of discharge in that neighbourhood ; the fact of pus occasionally trickling into the pharynx when in a recumbent position ; the occasional draining of pus into the mouth;

the presence of a fair-sized opening into the antrum; which latter, no doubt, accounted for the absence of any visible swelling; and lastly, the fact that the patient never knew how many teeth were knocked out. Mr. Woolf explored the antral cavity with a silver probe, and found, lying in a horizontal position, a hard substance, which he attempted to move; at first this appeared very difficult, but after a little perseverance he was able to move the end farthest from the nasal cavity slightly upwards, and then the substance seemed to fall into a favourable position near to the orifice opening into the sulcus. In fact, all further difficulty was at an end, as by means of an ordinary pair of root forceps, he easily removed it. The substance proved to be, as far as he could tell, the second bicuspid, and had attached to it at one point a piece of tissue, which was highly vascular at the time of removal, despite the fact that the tooth was entirely denuded of its root membrane—except at this point. An examination of this tissue under the microscope (for which he was indebted to Dr. Maughan) revealed a purely gum structure. Dr. Maughan expressed a decided opinion that it derived its vascular supply from the neighbourhood of the antrum and the mucous membrane of the nose, while it lay in that abnormal position. Mr. Woolf said he would be glad to know first how such a transplantation was brought about between the two tissues, and secondly, why in the face of a continual bathing in pus, which had the power of stripping off the periosteum from the surface of the tooth, the portion was enabled to survive. Having removed the tooth from the antrum, the cavity was well syringed, part of the fluid escaping into the nasal cavity and the remainder into the oral. A well-marked feature in connection with this case was the fact that the patient had never been able to breathe through the left nostril since the time of the accident; whereas immediately after the removal of the tooth he was conscious of having regained that power. A few notes relative to this part of the case, kindly supplied by Mr. E. W. Roughton, who made a thorough examination of the patient at the Royal Free Hospital, were given as follows:—"On looking into the left anterior naris, a fibrous band is seen stretching across from the outer wall of the inferior meatus to the inner part of the floor of the nose. This band had probably been formed from granulations, the result of irritation caused by the tooth impacted in the inner wall of the antrum. On the right side there is a spur on the septum nasi and some hypertrophic catarrh, conditions which of course have no connection with the affection of the maxillary antrum." Further treatment consisted in removing the tartar and syringing out the antrum daily with permanganate of potash for three weeks, at the end of which time the parts had regained their normal condition, although the orifice remained patent. Models were taken and a plate made to assist in building up the contour of the face. Although the orifice is not covered by the wing of the plate, yet the food is unable to pass up, owing to the extreme tension of the muscles upon that side.

The CHAIRMAN said they were much indebted to Mr. Woolf for bringing forward his most interesting case.

Mr. W. A. MAGGS thought Mr. Woolf's case very interesting from one or two points of view, one was that the tooth had remained so long unrecognised, and another, that it was tolerated for so long a time. There was no doubt that this very vascular tissue derived its supply from the antrum. He took it that the tooth was tolerated for so long a time, because there was a free opening into the mouth; he thought that the substance surrounding the central and lateral was tartar, but the doubt could be cleared up by putting it into some acid.

Mr. F. J. VAN DER PANT wished to ask how long a time elapsed from the date of the accident to the time Mr. Woolf saw the patient.

Mr. WOOLF expressed his regret that Dr. Maughan had been prevented from being present to support him, because it seemed from a pathological point of view peculiar that this tissue should be gum tissue; he was rather inclined to agree with Mr. Maggs as to the tartar, as there was so much about the teeth generally. The periosteum was stripped off to a great extent and the tartar seemed to steady the teeth in position, consequently the patient had the idea that they were getting firm in the mouth. In reply to Mr. Van der Pant, three years elapsed between the accident and the treatment.

Mr. A. W. BARRETT said the case he wished to relate to the Society was interesting as it showed that the value of electric illumination of the mouth in the diagnosis of antral abscess was not always reliable. Some three weeks ago a sister in the London Hospital was referred to him by Mr. Hovell for puncture of the left antrum, for what was believed to be an empyema on that side. The patient said that every morning from 9 to 12 a discharge of fetid mucopurulent fluid escaped from the left nostril and slightly from the right, and also passed into the back of the throat. There was no escape of pus during the night, nor when the head was inclined to other side. The discharge had lasted for four years, and her health had greatly suffered in consequence. There was no special pain complained of, nor was any swelling perceptible. The mouth was quite free from stumps and decayed teeth, and was in a perfectly healthy condition. All decayed teeth and stumps had been removed two years ago. Examination with a powerful electric mouth lamp attached to an eight cell storage battery showed an equal amount of translucency through each cheek. This was repeated on four occasions, always at different times of the day, and in the presence of three surgeons in addition to Mr. Barrett. Relying too much on this supposed aid to diagnosis, Mr. Barrett ventured to think that the left antrum was in a normal state, and in this opinion his friends agreed, and this was in opposition to the view of Mr. Howell. However, at Mr. Howell's request Mr. Barrett perforated, and thereupon a copious discharge of very fœtid yellow mucopurulent fluid was poured forth from the left antral cavity. Mr. Barrett thought that the lesson one might learn from this was that one should not depend on the supposed power of a purulent collection to obstruct the rays of the electric lamp.

The President said that he should be glad to hear any remarks upon the case from members present, On several occasions they had had illustrations of electric and other illuminations as a means of detecting antral disease. Both Dr. Scanes Spicer's and Mr. Arthur Underwood's communications on the subject would be remembered.

Mr. Charles Tomes then read a paper entitled "Studies on the Growth of the Jaws," which is published on page 433.

Discussion.

The Chairman, in inviting discussion, said that he feared the subject was one which they could better discuss after careful perusal of the paper.

Mr. F. J. Bennett wished to know if the diminution in length of one half of the jaw, mentioned by Mr. Tomes, was actual or only relative to the increased length of the opposite half.

Mr. A. W. Barrett asked how it was that the square aspect was produced in the growth of the bone, looking at the diagram it rather suggested that it would give it a pointed appearance?

Mr. H. T. Reed asked if the length was due to the prominence in the canine region?

Mr. Paterson wished to know if Mr. Tomes had examined any case amongst human jaws for the persistence of the suture line, normally existing in most other Primates, between the pre-maxillary and superior maxillary bones; and if so, whether he had observed any malposition of the teeth of the incisor region in connection with such persistent suture. He (Mr. Paterson) had a portion of a human skull, perfect as far as the upper jaw was concerned, of an age when the wisdom teeth were erupting in the arch, in which such a suture line existed, and in that case there was no anterior protrusion of the teeth.

Mr. Ackery enquired whether there was any marked difference subsequent to the extraction of the first bicuspid, and owing to the centre of the mouth being shifted over to the left side?

Mr. W. Hern wished to know if Mr. Tomes had noticed whether the diminution of length, from the line of the temporary molar to the incisor, had any relation to the eruption of the twelve year old teeth?

Mr. W. A. Maggs said that a point occurred to him, which gave *prima facie* corroboration to the results of Mr. Tomes' investigation. It was that the diastema is much larger in adult than in pre-adult life in anthropoid apes, and this being limited to the premaxillary bone, it showed that the growth of the superior maxilla in the anterior direction is practically confined to the premaxillary region.

The Chairman said that the paper and the discussion upon it had very forcibly impressed upon him the enormous amount of information which Mr. Tomes had gleaned from this apparently simple set of models, showing how valuable such models might be, and how much knowledge might be got from them. He had only one question to ask, and that was with regard to the inter-maxillary bone, which Mr. Tomes had said after a certain age ceased to grow. He (Mr. Hepburn) had formed a sort of idea that protrusion was principally associated with the inter-maxillary bone, and that it reached its greatest development about the age of eight, if the natural growth of the bone ceases before that period, that would not preclude the possibility of abnormal growth taking place afterwards, it might account for the protrusion of the teeth. In the example which Mr. Tomes had shown them of the chimpanzee the squareness of the inter-maxillary bone seemed to do away with the protrusion which might be accounted for by the enormous size of the diastema.

He should like to know if Mr. Tomes had formed any opinion as to the real seat of the increase of bone, whether it arose from pressure or from abnormal proliferation of bone cells?

Mr. TOMES said that before replying to the various questions, he would say that whether there is any persistence of the inter-maxillary suture in the prognathous African races for a longer period than in European races, is not known, the material for investigation, so far as he was aware, did not exist in England. There were plenty of adult specimens; but very few of babies; possibly in the American Museums there might be such specimens. Mr. Paterson had mentioned that he had an adult skull in which a suture was persistent. Of course, such skulls were to be found here and there, but he was not quite sure if that would affect the argument very much. Supposing a suture, that is normally obliterated, did remain, it did not follow that the growth was going on in it. There are plenty of sutures which remain sutures, but in which growth was not going on. They had no material to say whether the irregularity, which they called anterior protrusion, was or was not due to this cause. He read this short paper now, because it seemed to him to hang naturally to the discussion which had taken place at a previous meeting upon anterior protrusion.

Several questions had been asked about measurement. Mr. Bennett asked whether the diminution was relative or absolute. Well, it was both, it was absolutely less in the adult than in the child of six, but as Mr. Ackery pointed out, there was a shifting of the centre. Mr. Tomes thought there was a *vis a tergo* that side, which shifted the teeth forward. All that he wished to emphasise was that the ultimate diminution, which was pretty large, might have been due to the extraction. Yet this diminution was beginning at the time when all the temporary molars were still *in situ*. Then he had been asked as to the prominence of the canines. Well, with reference to that they were rather prominent, but they ultimately became fairly regular. He should like to endorse a remark made by Mr. Hepburn, who had anticipated what he intended to say, viz., that sets of models of the same mouth at different periods of growth would be most valuable. He thought there was nothing, apparently, to be learnt, prior to the age of six ; from that age up to 12 yearly models might be taken, so that it would not be a very laborious matter, and unless he was very much mistaken there would be much learned from them. Mr. Barrett had spoken as to the squareness of the jaws. In presenting the matter to them very briefly, he (Mr. Tomes) had perhaps made it too diagrammatic and possibly over stated it, in his desire to be clear, and Mr. Maggs pointed out that the large diastema necessitated considerable squareness. Mr. Tomes was afraid that he did not make himself quite clear about the chimpanzee. It has the most human dentition, and it is the only ape in which the intermaxillary suture becomes obliterated at an early age.

Dental News.

The American Dental Society of Europe, will hold its eighteenth meeting at Basle, Switzerland, August 1, 2, & 3. Members of the profession are cordially invited to attend Clinics will be a special feature of this meeting. The University will place desirable rooms at the disposal of the Society, and an ingenious amphitheatre for accommodating in the immediate vicinity of the patient a larger number of spectators than are able to witness operations under the ordinary circumstances, will be loaned by the Swiss Dental Association. Programmes may be had on application to the President, Dr. Bryan, of Basle, or to Charles W. Jenkins, Secretary.

Mr. Harry Rose has been elected Dean of the National Dental Hospital and College.

At the meeting of the Odontological Society last week, the President received many congratulations uponhis re-occupying the chair, after his recent illness.

Dr. Thomas Gaddes, of Denver, formerly Dean of the National Dental Hospital, is now on a visit to England.

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FACIAL HERPES SECONDARY TO TOOTH-ACHE.

By George Carpenter, M.D. London, M.R.C.P.L.
Physician to Out-Patients to the Evelina Hospital for Sick Children, &c.

The object of this Communication is to bring to the notice of the Dental Profession, an affection which, as far as I can gather, has remained hitherto undescribed, or, rather, perhaps, I should say, its causation has not been recognised.

Two classes of disease come under the generic term herpes, in one case, the neurotic origin of the complaint is incontestable ; as to the other variety, the influence of the nerves in its production is not so clear.

In Zoster, or shingles, the eruption is due to direct irritation of the nerves supplying the skin of the part, and it may be induced by irritation of the nerve trunk in any part of its course. A number of *post-mortem* examinations have now demonstrated the fact that the irritation is in the shape of inflammation in the posterior spinal ganglion (*Barensprung*) in many instances.

Neuritis of the nerve anywhere along its course is, however, quite sufficient for its production. Injury to the spinal cord has also produced the complaint, as well as disease of this nerve centre.

The peculiarity about this affection is, that the course of nerve implicated, is roughly mapped out by the herpetic eruption. A second attack is exceptional. In adults, it is frequently attended by pain, and in the aged, sometimes followed by intractable neuralgia. In children, the affection is nearly always a painless one.

In the other variety, the eruption is similar in appearance, but differs from it, in that it does not follow the course of a nerve trunk so obviously, and is symptomatic rather. Thus, patches of herpes about the mouth may accompany various diseases of the oro-respiratory tract, *e.g.*, pneumonia, tonsilltis, diphtheria, an ordinary "cold," or what not. This variety is akin to Preputial Herpes, seen in cases of irritation arising along the genito-urinary tract. Unlike Zona, it frequently recurs, and in a great number of cases, it is not unilateral.

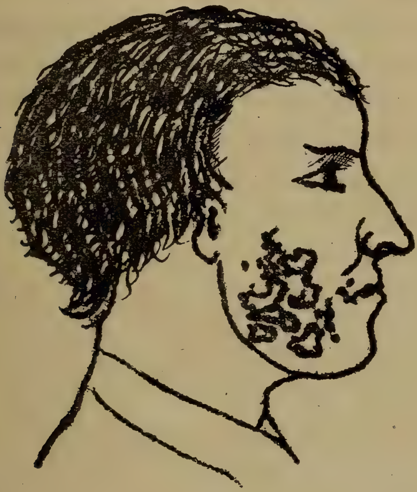
With this introduction, I will pass on to the subject matter of this paper, and, as an illustration, record a case in full.

Case.—J. N., a male, æt., 9 years, was brought to my outpatient's at the Evelina Hospital for Children on Nov. 11th, 1889, for a "breaking out of the face." On enquiry, the fact was elicited that he had suffered from "face-ache" on the 5th, and that the face "broke out" on the 7th. His mother, and the boy himself, assured me that only "luke-warm water" had been applied. The boy, on being closely questioned, stated that the "pain came in his tooth, and then it hurt his face."

The part attacked was the right cheek. There was a small patch of herpes at the angle of the mouth. There were six large patches, of corymbose grouping, of large opaque vesicles on the cheek proper (between the zygomatic process, the ramus of the jaw, the body of that bone (inferior border), and the prolongation downwards of the naso-labial fold) and in some situations they were so confluent that it was well-nigh impossible to distinguish individual vesicles, but elsewhere the patches were very obviously made up of separate lesions. Mixed with these larger patches and surrounding them were, single vesicles, and small groups, about the size of a large pin's head. There was a certain amount of redness about the whole patch of disease.

I now give an extract of the dental notes made by Mr. R. Denison Pedley on this case, so that their accuracy may be relied upon :—

"*Condition of mouth.*—Teeth, as a whole, good. On the right side was a black, necrosed fang of the second lower temporary molar. The first upper permanent molar was carious and loose, as was also the temporary molar in front of it. All three were removed. It was then found that the upper permanent molar was deeply decayed ; the alveolo-dental mem-



brane on the mesial surface was much inflamed and thickened, especially on the palatal fang, at the apex of which were the remains of a small abscess sac. The two buccal fangs were not fully developed. The partially absorbed roots of the temporary molar were in close contact, on the distal surface, with the permanent molar, and the periosteum there, was also much inflamed and thickened. There was a history of a swelling on the right side of the face on a former occasion."

It is, of course, an every day occurrence for sufferers with tooth-ache to apply, and have applied, various remedies in the shape of counter irritants to the face, but here no such treatment has been in operation. The eruption too was quite unlike a dermatitis due to that cause.

In addition to the case I have recorded, I have seen two others somewhat similar.

Associated with tooth-ache, I have had occasion to observe herpes at the angle of the mouth, on the same side, on several occasions—it will be noticed that the case I quote, presented such a symptom in addition to that mentioned.

It is perhaps hardly necessary for me to remark that the sensory nerve supply of the cheek is due to the 5th nerve.

The superior maxillary nerve (2nd div. 5th) on its emergence from the infra-orbital foramen breaks up into branches which supply the side of the nose, the upper lip and the lower eyelid. These branches form connections with the facial nerve. The inferior dental nerve (3rd div. 5th) having supplied the teeth, passes out to the cheek through the mental foramen and breaks up there for the supply of the face, an external branch for the integument of the cheek and an internal branch for the lower lip. Both these join the facial. The facial (7th), the motor nerve, has free communications with the two lower divisions of the 5th, through its infra-orbital branches and cervico-facial division. These two nerves form a dense plexus over the side of the cheek.

It will be seen that my cases, were in one respect, quite unlike ZONA, in that the eruption did not correspond obviously with the distribution of the nerve trunks of the 5th nerve, but it must be remembered that the terminal ramifications of these are a most intricate lace-work of nerves underlying the cutaneous surface of the cheek, the trunks themselves being comparatively short.

The connection between cause and effect in the shape of dental nerve irritation, followed by facial herpes, has appeared too intimate to dismiss these cases under the other heading (symptomatic herpes), and I am disposed to look upon them as a true ZONA set up by neuritis of a dental nerve filament possibly extending to the main trunk of the nerve, or mayhap of reflex origin through the Gasserian ganglion.

Further, in the so-called symptomatic herpes, occasional discrepancies arise. Thus, as an illustration, in one case attended by rigors and fever, I saw the whole of the lips involved by a herpetic eruption, and some herpetic vesicles over the seat of the emergence of the superior maxillary nerve at the infra-orbital foramen. This might then be placed under a mixed heading. Again, I venture to assert that ZOSTER does not always coincide with the whole of any given nerve territory, and that it may recur several times.

For some years now, I have had from time to time recurrences of a patch of herpes on the right buttock. It makes its appearance at any season, is attended by burning and itching of the parts, and covers an area of about the section of a pigeon's egg. It always appears in the same situation. At the time, I am apparently in perfect health. This eruption I have had at least half a dozen times.

The patch has been seen by Dr. Colcott Fox, and pronounced an unquestionable herpetic eruption, and on this, the last occasion, two fresh patches subsequently made their appearance along the course of the nerve, and Dr. Fox could not but admit then with me, that the eruption was a typical ZOSTER.

It is difficult to disabuse one's mind of the idea that this is, and has always been, due to some irritation of one of the cutaneous filaments of the small sciatic nerve, somewhere along its course from origin to distribution, although it did not obviously follow one of the nerve trunks until the present occasion.

Then again, ZOSTER of the first division of the fifth nerve is not a rare affection, and if this is the case, why should not the two other divisions of the fifth nerve occasionally suffer?

My main object, however, is to call attention to this phenomenon with the hope that it may receive some more extended observations from those who are in the habit of seeing dental cases.

This communication, however, has its practical side, as well as raising points of considerable interest from an ætiological standpoint. An eruption of such a character on the cheek should suggest an examination of the teeth, even if the patient's attention has not been directed to them, and a visit to the Dental Surgeon, if necessary, if he be not already under the care of one.

Buckingham Palace Mansions.

FAVOURITE TOOTH-WASH.

Oil of Peppermint ...	30 minims.	Tincture of Cudbear ...	3 grains
,, Spearmint ...	15 ,,	,, Myrrh ...	1 fl. dr.
,, Cloves	15 ,,	S. V. R. to	16 oz.
,, Cinnamon ...	45 ,,	Mix.	

THE TREATMENT OF CLEFT PALATE.*

By W. Smithard, L.D.S.I.

It is my intention this evening to give a few of the cases of "Oral Deformity" which have come under my notice and treatment in the course of practice. I do not pretend to claim any originality in their treatment, but present them for the purpose of opening a discussion on the subject.

I have here three models of Congenital Cleft Palate ; the 1st, involving about two thirds of the soft palate ; the 2nd, involving the whole length of the soft portion ; and the 3rd, extending through the length of the hard portion, the two central teeth and right lateral being missing. I have also three models of secondary formation, of which I will speak later on. Now, in the treatment of Congenital Cleft, there are two courses open to us, the one being the surgical operation of staphyloraphy, the other mechanical treatment, by means of an obturator. In the surgical operation, it is necessary to divide the levator palati, the posterior pillar of the fauces, and very often, the anterior pillars ; which, to a great extent, paralyses the movement of the soft palate, and, therefore, is a great hindrance to speech and swallowing, besides drawing down the palate and diminishing the space at the posterior portion of the mouth. Such being the case, I am not in favour of staphyloraphy.

By making a properly constructed obturator, which will adapt itself to the movements of the soft palate and also supply the missing portions, I consider that better effects can be obtained than by staphyloraphy. Having decided to make an obturator, the first thing to be done is to get an impression; I have here some trays made for that purpose, but which are of no use whatever. The most useful form, and one which can be used in all cases, may be made by the use of an ordinary tea-spoon for the foundation, with a sheet of gutta-percha placed on the back of the bowl and moulded to a rough model previously taken in Godiva, or any other suitable material. After having trimmed up the anterior portion around the teeth, allow the posterior portion to extend a little, then slightly warm the gutta-percha and place it in the mouth, and by so doing, the posterior portion will be found to adapt itself to the pillars of the fauces and the pharynx; then take it out of the mouth and trim up the posterior portion, bending the edges slightly up, and roughen the surface in order that the plaster may adhere.

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* Read before the Manchester Odontological Society.

The advantage of this tray is that it takes up no unnecessary space, which is a thing of great importance. The next step will be to place the patient in such a position that the operator is able to see all that he is doing without having to stoop; then mix the plaster in the folllowing manner: take about ½ a pint of warm water, dissolve in it a salt spoonful of salt, (this will make it set quicker) pour a sufficient quantity into a basin, proceed to sprinkle in some of the finest plaster, stirring it all the while with a spatula until it is of the consistency of cream; a little rouge will also make the plaster set quickly, but this I would not advise, as in my opinion the salt is sufficient for this kind of impression taking. Pour some of the mixed plaster over the tray and place it in the mouth, at the same time bend the patient's head forward until the posterior portion of the tray becomes horizontal, thus preventing the plaster from falling off at the back and also allowing it to flow over the borders of the cleft. After getting the tray in position, hold it firmly so, until the overflow in front of the tray will break off with a clean fracture; then lose not a second, but force down the tray with steady pressure, bearing in mind that every instant makes the difficulty of getting it down greater.

In my practice I make it a rule to take two impressions, the first often being imperfect through lack of plaster or from other causes.

Having removed the tray I proceeded to remove the plaster down the centre of the cleft to within $\frac{1}{16}$ of an inch to the borders of the cleft; on this portion I built up a ridge of wax. Then proceed to mix more plaster as before, placing a good supply on the ridge of wax; by so doing the plaster runs down the sides, and so makes a good overlap, the wax ridge also makes it easier to break away in taking out the impression, and the first impression acting as a guide in placing the tray in position, and avoiding any unnecessary plaster; on taking out the impression, the fractured portion will remain in the cleft, this need cause no uneasiness, as the patient's head being placed well forward, it is not liable to fall out in most cases, but can be carefully lifted backwards and out with a pair of tweezers, the portions may then be fixed in position with a little wax &c. It is now ready for casting in plaster, first smearing it over with soap or oil; the model may be cast in the usual way as for a plate piece, then trim off and saw in two. The model being now complete proceed to make the obturator. No set rule as regards shape can be made, as all cases vary somewhat, the chief point to bear in mind is to make an apparatus that will imitate all the movement of a normal palate.

Having decided upon the form, model the velum in wax or gutta-percha; this may be tried in, and if it is rightly constructed it will be found to close up the nasal cavity when in the act of swallowing, and when the palate is in a relaxed state it will leave a space of about a ¼ of an inch from the wall of the Pharynx. We next proceed to make a duplicate in vulcanite, the borders of the flaps should be tapered down as thin as is consistent with strength and durability, at the same time allowing them to bend with the pressure of the muscles of the palate.

By making the duplicate I am able to get a greater polish than I should otherwise do, for what the duplicate is, so will be the finished piece.

We now cast a plaster mould in the usual manner.

When finished, make a duplicate in type metal, and, having cast the metal mould, polish the surface with powdered pumice and water, then with whitening ; great care should be taken to see that the joints are quite accurate, if they are not, the velum will be in an unfinished state. It is now ready for packing, but must not be over packed. I use Ash's Vela Rubber and vulcanize 2 hours at 240°, 2 at 260°, and 2 at 270° Fahr. If there should happen to be any unfinished edges, these can be slightly touched with a piece of hot wire run over the portion. It is now complete and ready to attach to the plate which has been made in the mean time.

There is another and a simpler way of making the velum, and one which is very useful for charitable purposes, especially if the velum is made in two pieces ; instead of making the mould as I have described, take the vulcanite patterns and flask in the ordinary way, as for a vulcanite upper denture; then open the flask, take out the patterns and line the moulds with tin-foil, you then pack with the vela-rubber as already described, taking care not to over-pack. The two halves may then be joined together. A fault about this mode of moulding is, that one does not get such a smooth surface as by the former method.

After inserting the piece, I give the patient instructions to read aloud for an hour or two every day, at the same time taking care to educate the muscles of the palate in such a manner as to allow the voice to pass through the mouth, instead of, as before, through the nasal cavity.

PREPARATION OF ROOTS FOR CROWNING.*

By Frank Hampton Goffe, L.D.S. Eng. & Edin.,
Assistant Dental Surgeon, Birmingham Dental Hospital;
Demonstrator of Mechanical Dentistry at Queen's College.

In preparing teeth and roots for artificial crowns, you have either a live pulp, or it may be dead or dying, and in my opinion, the best for crowning is where the pulp is devitalized by the operator.

Very often you have to crown teeth where the pulp is not exposed; now, there are different methods of destroying the pulp in these cases: one, is to give the patient gas, and then, with a sharp drill, to cut into the pulp, and endeavour to remove it with a pulp canal cleaner, if you cannot clear it all out entirely, you cause a great amount of hæmorrhage; the cavity must then be plugged lightly with strong carbolic acid, till the next day, when the remains will very easily be cleared away, this is only successful in single straight-rooted teeth, and some practitioners claim great success with it, though I must confess to almost complete failure.

Another way, Dr. Evans mentions in his work on crowning, is to cut two grooves, one on the labial and the other on the lingual aspect of the crown, and with sharp excising forceps, cut the crown off; very often the pulp adheres and comes away with the crown, if not, it remains projecting over the edges, this must be saturated with carbolic and cocaine ; and then take a piece of hickory stick, sharpened to a point, and drive it forcibly into the pulp, when you withdraw the stick the pulp usually comes away with the peg, but should it fail to do so, the pulp will probably be, to a large extent, killed, and it must again be saturated with carbolic and cocaine, and removed as well as possible. The great fault is, that if the patient is at all fidgetty or nervous, it is impossible, as making the grooves is, for the bulk of people, extremely painful, and when you grasp the tooth with the forceps, it becomes more than they will submit to.

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* Lecture delivered to the Dental Students at Queen's College.

The usual plan is to devitalize the pulp with arsenic, which probably accomplishes its work by thrombosis, that is, the formation of clots of blood which strangulates the circulation. I found the usual preparations of arsenic a little unreliable, so I always make it myself, as follows :—

Acidi Arseniosi, gr. xij.
Morphiæ Acetatis, gr. ij.
Creasoti, q. s.
Misce.

The paste must be in absolute contact with the pulp, and should be left for at least, two days ; it is a great mistake to see the patient the next day, as very often the pulp will not be absolutely dead to the foramen, and the pain you cause makes them nervous, and lose some faith in the operation and in crowning, one of the most important features is to have the perfect confidence of the patient.

Some believe that immediate extirpation of a live pulp gives better results than the more gradual one by arsenic, but I must say that I have not found it so, for it is very unusual to have any inflammation or complications after its application, if proper care is taken to securely plug it in position, and I should certainly advise all young men to practise this in opposition to the more heroic methods.

Now having the pulp destroyed, you must carefully remove the whole of it with nerve barbs and pulp canal cleaners, then taking a flexible drill, clear the walls of the pulp canal, using very little pressure so that you may not make a false passage, or force any debris through the apical foramen ; in treating roots, pay great attention to your instruments rendering them all aseptic, this is most readily done by wiping them with a solution of carbolic acid, 1 in 40. Hot air should be continually injected, as this acts as a powerful germicide. I find an ordinary hot-air syringe answer every purpose, one mistake I think young operators make, is not using it enough. Dr. Evans suggests that a silver probe connected with a ball of silver or copper, which has been warmed to a dull heat, is introduced into the root canal, and as silver possesses remarkable properties of conducting thermal changes, the heat is transmitted to the point of the probe, very rapidly this évaporates all the moisture and gases out of the dentinal tubuli : if everything has been carefully done, you need not dress the root again, but proceed immediately to prepare it for the crown, if you are at all afraid, it is better policy to give the root a dressing and this is a point that cannot be too strongly impressed in your mind that the whóle success depends on the health of the root, no matter how mechanically perfect your work may be, if the root takes bad ways your crown comes to grief; for dressing a root like the foregoing, I do not think you can improve on eucalyptus oil and iodoform, sealing it up securely to prevent moisture or any foreign substance getting into the root.

But sometimes you have to crown roots where the pulp has been dead some time, and the root in a most unhealthy condition; after having cleared out the root as well as you can with pulp canal cleaners, you can introduce your antiseptic agent, and the most powerful we have is bichloride of mercury. I generally use it with alcohol thus :—

Hydrargyri Perchloridum gr. ij
Absolute alcohol ℥j

The alcohol dries up the moisture and leaves the perchloride of mercury sublimed, after injecting this up the root you must pump up peroxide of hydrogen which has the property of readily giving up oxygen, thus oxidizing or burning up any lurking micro-organisms, or a mixture can be used of the following :—

Hydrogen peroxide gr. F. ℥j
Hydrargyri Perchlordum gr. ij

As you pump the peroxide of hydrogen up the root, you see it forms soapy bubbles, when these cease, thoroughly dry the root using the hot air syringe for some time.

Now dress the root with iodoform in a solution of sulphuric ether, or simply in eucalyptus oil, if the smell of iodoform is objected to, you can substitute iodol, the great point in treating roots is absolute dryness so protect them, if possible, with the coffer dam, when this is impossible, you must do it as perfectly as you can with bibulous paper and napkins. If these precautions are followed, I do not think you need fear any after trouble.

There are a great number of roots that cannot successfully be crowned. If there is a chronic abscess of long duration, with a good deal of inflammation, or the alveolus absorbed, you had better not make a start, you may be sure if a root has been pulpless with fœtid matter in it for some time, absorption of the root has commenced, and it is in my opinion crowning such cases that brings the operation into discredit.

Having the root quite clear and aseptic, you may seal up the apical foramen. Very many substances are used by different men, the most popular is, after drying the canal, take a piece of gutta-percha dissolved in chloroform, and gently pack it, using no force, into the end of the root. The plan I generally adopt is to use a pellet of gold, this is very easily accomplished, and you obviate all risk of forcing anything through the foramen.

Some of the main points in shaping the root I shall just mention, and all the other details will be treated in connection with the special modes of crowning; the root cavity should be covered over with a piece of gutta-percha or pellet of wool, to prevent the blood from gums, which is sometimes excessive, entering, as blood is amongst the most putrescible of matter.

If you are going to fix a gold crown, take a thick corundum wheel and cut the decayed tooth away till you have a good distance between your root and the occluding tooth. I like to trim the sides of the root parallel, so that they become gradually slightly larger; you can very easily see how this acts, as the patient bites hard on it the crown becomes tighter and firmer; if you have a pin fixed in any root I consider it advisable to fit it firmly in before the addition of any cementing substance, endeavour to have the retaining pin in the root longer than the crown as it will then stand a much greater strain than one in which the crown is the longer; so it becomes of great importance to clear out your root canal, and make it as long as possible, always, of course, being careful not to go through the apex; this is sometimes a trifle difficult, for if you examine roots you will see it is very common for them to be a little irregular, and near the apex give a slight bend so after passing up your slender explorer mark the length on your drill and do not on any account exceed this length.

In front teeth you have to consult your taste and get teeth to match perfectly, and I do not think the practice of placing gold crowns on upper bicuspids can be sufficiently condemned, you may get a good piece of work from a mechanical point of view, but true art is altogether wanting.

Never have the root quite flat on the surface for porcelain crowns, the proper shape is for it to be roofed shaped with the longer slope towards the labial aspect, as this makes you cut away less of the crown and places the joint some distance from the front, so that the highest point of the root is hidden, and does not show any fitting of the root and artificial crown ; at the cervical labial edge, the root should be cut into a semicircle following the natural contour of the gums, and it ought to hollowed out below the edge of the gum so that the new tooth has the same appearance as the natural ones of growing out of the sockets; this, of course, does not apply to the palatal aspect which can be left a little higher than the gum edge which increases the length of the root canal, and forms a good buttress at the back ; shaping roots after this fashion makes the crowns very firm, as it prevents any side to side movement, and also any rocking from before back : if I find the root badly decayed, my usual plan is, after getting the root perfectly aseptic build it up to the natural shape with Flagg's submarine amalgam and at another sitting to fix the crown. These are, of course, only a few hints on crowning, all the other points I will deal with later on.

THE PROPER PERIOD FOR REGULATION.

By Ernest C. Davids, L.D.S. Eng.

The proper period at which to begin interference in cases of irregularity, is of great importance if we wish to obtain perfect results, and in arriving at a decision, many conditions must be considered, for instance, the character of the deformity, the age, health, and sex of the patient must be taken into account.

Many irregularities are so slight that nature will, in the majority of instances, accomplish better results than a long course of mechanical interference, the canines and incisors, for instance, frequently erupt out of their position, but gradually find their proper places. If, therefore, the teeth are watched by a competent dentist from the time of their eruption until they are fully developed, the necessity for operations for the correction of irregularities by mechanical means is reduced to a minimum.

As an illustration, it may be stated that if one or more of the superior incisors show a tendency to occlude posteriorly to the cutting edge of the lowers, this may be corrected as soon as they appear through the gum, by judicious pressure.

We may thus correct, in a simple manner, deformities, which, if neglected, would call for a long period of mechanical interference to rectify.

Aside from the simple abnormalities, however, irregularities of the incisors are best left alone until after the canines have erupted. In fact it is as well to defer interference with any of the teeth posterior to the lateral incisors until the bicuspids and canines have erupted, their relative positions can then be studied, and perhaps with a single operation, their symmetry restored.

Sometimes an earlier operation ~~would~~ be advisable, such as extracting the first bicuspids before they have erupted, for the treatment of protruding incisors, but the above rule may be judged the safest in the majority of cases.

From these considerations it may be observed that no hard and fast rule as to the precise time for interference can be given, but approximately the best time is from the twelfth to the fourteenth year.

At this time also the roots of the teeth are not developed fully, but are loosely held in the alveolus, the apical foramina are large, thus lessening the danger of cutting off the blood supply.

The likelihood of a satisfactory result, decreases yearly, from the age of fourteen years, as the osseous system is becoming denser every year, and the teeth surrounded by compact bone, offer a greater resistance to any attempt at moving them.

After twenty-four, the chance of a satisfactory result is very small, although it is possible to correct irregularities even as late as the 30th year, but the mechanical force necessary to produce absorption of the alveoli is such that it hardly appears safe to undertake it, unless the patient is prepared to accept the responsibilities of failure which may arise.

Having considered the proper period for regulating, there comes another question, of perhaps greater importance, viz,, the general health. It is a well known fact that the most favourable period for regulation is one of the most critical in the life of the patient. From twelve to sixteen the rapidly growing boy or girl is subject to many changes entailing great strain to the general and nervous system, prolonged hours of study, over exertion, bad air, sexual irritation, and many other disturbing elements, have all to be reckoned with, previous to taking a decided step.

Added to these are hereditary syphilis and the exnathemata.

We should therefore defer operation on young persons in delicate health, until such time as they have become stronger under proper medical treatment, and it is necessary that dentists should know something of these general conditions, so that they may place them in proper hands for constitutional treatment.

THE VALUE OF DIPLOMAS.

The holding of a diploma brings no vested right with it excepting when and where it is conceded by law. The people have a right to demand, if they see fit, that the physician, the pharmaceutist, the dentist, the lawyer, the teacher, shall have the necessary qualifications to discharge their duty, and in many States this right is asserted. If the people, so far as dentistry is concerned, should not recognize any diploma whatsoever, but force every new candidate for practice to take an examination before a Board, they would follow out the practice existing in older countries, they would secure a better educated class of professional men, and they would strengthen and encourage our colleges to better work, the indifferent institutions and indifferent teachers would speedily have to go into voluntary, or involuntary, liquidation, because there would be no longer any market for their manufacture.

CHAS. R. E. KOCH. *Amer. Dental Association.*

British Journal of Dental Science.

LONDON, JUNE 1st, 1892.

MICROBES IN THE MOUTH.

The first number of *The Journal of Pathology and Bacteriology*, which is to be issued immediately, is another indication that the important results obtained by a study of micro-organisms, continue to demand recognition by those concerned in the causation of disease. Dr. Sims Woodhead, the Director of the Laboratories of the Royal Colleges and the editor of the new journal, is assisted in the special departments of pathology by well known men, and, in addition, he has promises of collaboration from more than a hundred distinguished English and foreign observers. Since the time when Leeuwenhoek first found that "many small living animals" had his mouth for a habitat, much has been done, especially within recent years, to observe, compare, and reflect upon, the many species of microbes affecting the tissues and how they influence the life history of the higher organisms. This new science, Bacteriology, has sprung up, and it may be expected that the crowd of energetic men now at work, will continue to bring to light new facts explaining much that has been hitherto obscured, and that, too, in relation with a subject which has always held a foremost place in the human mind and the interests of mankind, viz:—the maintenance of Health and the occurrence of Disease.

Apart from the knowledge we now have, as to the dependence of dental caries upon the presence of micro-organism in the mouth, and as to the desirability of cleanliness in consequence, there are other lessons for dentists to learn from Bacteriology, which seem none the less important with regard to the maintenance of health, and which should also help to induce us to keep the oral cavity clean and sweet. For the investigations in this department of science have not only explained the way in which the teeth are destroyed, (an occurrence more or less directly influencing the general condition of health), but they have also been the means of suggesting a hitherto unrecognised factor in the causation of various diseases, the origin of which has frequently been looked for elsewhere, outside the body. It is now evident that the mouth, besides containing normally several species of micro-organisms, some six or eight kinds of which are always present, forms an excellent incubator for the cultivation of many other bacteria, and it becomes manifest that it is not always necessary to look farther for another point of entrance, or possible source of infection, in such instances as when pneumonia, or actinomycosis, attack a patient without appreciable cause.

The occurrence of suppuration, so far as it is dependent upon micro-organisms, may be due to the presence of one or more different species of bacteria, but we allude now to one which curiously enough is to be found in the mouths of healthy persons, and yet is the particular organism which is associated with acute croupous pneumonia. This pneumococcus, not only causes abscesses during the progress of pneumonia, but has been proved to produce suppuration in patients who have never suffered from pneumonia. Very many cases of cerebro-spinal meningitis have also been caused by the pneumococcus, and an interesting instance has just been recorded in the *British Medical Journal.* If the membranes of the brain can be thus attacked, it is not surprising to find that the ear, the nose, and the frontal sinus, may also be affected, and this brings to our mind a suggestive case, which has not yet been reported, where, coincidently with abscess due to neglected fracture of the central incisors, there occurred a suppuration of the middle ear, with perforation of the membrana tympani. Dr. Ruffer in the *Medical Annual*, points out that the frequency with which the pneumococcus is the active agent in producing suppuration is to be accounted for by the fact that it is commonly present in the mouths of even healthy persons, and under certain circumstances passes through the Eustachian tube to the ear, or to the brain membranes, or gives rise to abscesses in various parts of the body. Many other septic forms have been isolated from sputum, and Dr. Sims Woodhead insists that infections of different kinds may follow injuries of the mouth and adjacent parts. He has seen several cases where death has ensued with symptoms of septicæmia or pyæmia, due to the extraction of a tooth or the lancing of the gums, in patients with imperfectly cleansed mouths, the germs either entering the lymphatics or passing directly into the blood stream.

In face of these facts, it surely behoves dental surgeons to pay every attention to cleanliness, and, if possible, also help to discover the much needed antiseptic mouth-wash, which, while it is harmless to the tissues, may be reckoned upon to destroy microbes in the small space of time during which such applications are usually retained in the mouth. The time is coming when a course of bacteriology will form part of the medical and dental students' curriculum, and there are already opportunities provided for all those with a little spare time, and the inclination to learn the methods employed, to verify for themselves some of the facts. For those who wish to read on the subject, we should recommend the excellent book in the Contemporary Science Series, written by Dr. Sims Woodhead, and entitled "Bacteria and their Products."

Apart from the interest which we naturally feel on the more restricted points, there are other and wider issues concerned in the future development of this science, and the practical application, of the results obtained, in the direction of preventative and curative medicine. There is still the question as to immunity, the battle between leucocytes and microphytes (or may we spell them microfights ?), and other matters which must be left to the advance guard of workers; but there is no excuse for a disregard of the simpler facts made known to us, and even if we recognise the difficulty of antisepticising the mouth so thoroughly as to entirely prevent dental caries, yet we should agree with Dr. Woodhead, that a good tooth brush, plenty of water, and some antiseptic dentifrice applied morning and night, may afford a greater safe-guard against many diseases than most people are aware.

TIC DOULOUREUX.—Oliver Wendell Holmes has a casual, but vivid, reference to this terrible complaint when demanding that allowances should be made for certain characteristics of poets. "Every now and then, a tiger that nobody can see, catches one side of your face between his jaws and holds on till he is tired and lets go." Such a martyr is felt to have a claim upon the consideration of his fellows, more especially as he is frequently without the slight consolation which might be derived from a simple explanation of the actual cause of the attacks. In the Abstract from the *Medical Annual*, on another page, will be found an interesting attempt to explain the condition which gives rise to some of these cases, although it would probably not do much good to tell sufferers that their arteries were degenerating.

As was pointed out in the *British Medical Journal*, Dr. Dana's argument is defective, inasmuch as he has not examined the infra-orbital arteries of healthy persons from 40 to 60 years of age.

EFFECT OF LIGHT UPON BACTERIA.—Experiments have recently been made, showing the influence of sunlight and electric light, respectively, upon bacteria. The typhoid bacilli grown upon gelatine were employed; two tubes were placed in the dark, two exposed to direct sunlight, and two to an electric light, of 1,000 candles. The exposed tubes were afterwards placed with the others in the dark. It was found that three hours of the electric light had a distinct effect in checking growth, but that two hours of direct sunlight, produced a stronger effect than electric light in six hours.

TRICHINOSIS OF THE TONGUE.—A case was lately reported, in the Epitome of the *British Medical Journal*, where an ulcerated tumour of the tongue was diagnosed as epithelioma and the organ removed, the patient making a good recovery. The microscope showed that the disease was not epithelioma, but trichnosis, which had caused sclerosis and ulceration round the cysts. The operator thought the mistake was not of practical importance, for removal was indicated in either case. The growth commenced some ten or twelve months previously as a small ulcer which gradually increased in size, became crateriform in shape, with everted edges and a fibrous looking base, uneven and perfectly clean. There was no history nor sign of syphilis or tuberculosis.

DEATH IN THE OPERATING CHAIR.—In *Zahntechnische Reform* is an account of the recent death of the opera singer, Frau Brandt-Goertz, of the Imperial theatre in Hanover, which occurred under tragic circumstances in Cassel. Frau Brandt arrived there from Hanover April 11th, to visit her husband and family. She had complained for some time of violent pain in the right upper jaw caused apparently by a molar which was loose; there was also a fistulous opening on the gum. About midday she went to a dentist, who was formerly well known to her, and who had frequently attended her, in order to have the tooth extracted. When Frau Brandt entered the room she was in such a very agitated condition, that as the dentist noticed also a marked increase of corpulence, he refused to undertake the extraction, especially as the patient wished for an anæsthetic. As she was, however, soon returning to Hanover, and wished to regain her health the dentist yielded. She took her seat in the chair but having complained of the disagreeable smell of the narcotic, requested the dentist to proceed with the extraction. This was successfully accomplished, but she must have suffered violent pain afterwards for she screamed loudly. The dentist succeeded in quieting her and handed her the usual glass of water to rinse out the mouth. She had hardly done so when the colour of the face suddenly changed, and without uttering a sound she sank back and died. Attempts to restore life by means of the electric current, ether injection and artificial respiration were kept up for three quarters of an hour but without avail. This would appear to be a case of syncope produced by mental emotion and the shock of extraction, with fatty degeneration of the heart. The patient was only 33 years of age.

THE LABOUR COMMISSION. In connection with the evidence of workers in chemical manufactories, many questions have been put as to whether the teeth are much affected, and although there appears some reason to believe that dental troubles do occur in some cases, the replies of witnesses are too vague to allow one to form anything like an accurate idea as to what the exact condition is. Thus, one witness from Tyneside said the teeth got loose and decayed, there was generally something wrong with them, but he would not say that the work affected the teeth more than the chest and lungs, and the digestion of the men. Another said the bleaching department with the chlorine gas was the worst The sulphuric acid from the vitrol attacked the teeth, and he had seen women nearly wild with the pain, many times wishing that they had no more teeth in their heads than there were holes in a sack. Still another said that the salt-cake "burns out" the teeth in a very short time unless they are washed frequently, and the face is kept muzzled. Some of the men bite the muzzle in order to protect the teeth; he thought this bad, as it brought the teeth in contact with the gas, and rots them in a very short time. Another who had worked in the salt-cake department for 17 or 18 years, said all his back teeth were gone owing to the gas he had inhaled. Nothing is said as to the condition of his front teeth which surely would have been more exposed. The whole matter seems to be one which might well be studied by some of our readers practising in such districts, who would then be able to put upon record opinions of some value.

A New Dental Journal. We have been interested in reading the first number of *The Dental Journal* which is published by the Students' Dental Society of Michigan University. The ladies seem to be taking their share in the management, and there is a good paper by Miss C. M. Stewart on Nervous Affections as caused by diseased teeth. In another paper an attempt is made to prove the existence of two membranes in the tooth socket, that is, the root membrane is in separable layers. Whilst there may be some difference in the closeness of the arrangement of the fibres of the connective tissue in different parts, and some of the cells form bone and others only cementum, yet we cannot agree with the suggestion that "the alveolar and dental membranes are not identical." Further on, we presume that the references to cormary, and bubar odontoma are to be explained by the absence of the proof-reader, and by a suggestion that those who receive the journal should remember that it is the first issue, and that the work is new to the editors. A personal experience would incline us to a merciful view of typographical errors, and we can only say that the readable matter leaves little to be desired. We wish the *Dental Journal* the success it deserves.

ANONYMOUS CRITICISM. The *Dental Cosmos* administers a rebuke to one of our contemporaries in an Editorial, on anonymous criticism, which concludes thus "The kind of publication referred to, if persisted in, must involve consequences which in the name of professional aspiration and progress on both sides of the Atlantic we should deplore. Whatever in the minds of our British brethren may be the status of American dental practitioners as compared with themselves, we are loath to believe that the utterance cited, in any degree represents their estimate. There exist, no doubt, honest differences of opinion, which are fully recognized by both sides, and which careful and unprejudiced investigation must in time satisfactorily adjust. But a true spirit of professional harmony can never be established by the cowardly and unmanly method of anonymous criticism, to which the dental journal in question has opened its pages —a method as unworthy of an intelligent and civilized journalism as it is repugnant to the acknowledged British love of fairness. We suggest, therefore, that our esteemed contemporary can better enhance the value of its publication by exerting a fostering care over all tendencies looking to a harmonization of international relations in dental professional matters, than by abetting in the impotent vituperations of anonymous individuals, whose highest motive is a desire to air their mental sores to the disgust of a more enlightened public."

The question as to signed articles, or letters, is too large to be discussed here in a few lines, but our transatlantic and world-known contemporary may be reminded that there are not wanting instances of Journals, nearer home, inserting criticisms which are not rendered more pleasant because appearing over a known signature, instead of initials.

Reviews.

Guide to the Administration of Anæsthetics. By Henry Davis, M.R.C.S., 2nd Ed. H. K. Lewis, London, 1892.

The necessity arising for another edition of this book has enabled the author to bring his work up to date, and he, therefore, briefly discusses the conclusions of the celebrated Hyderabad Commission, besides adding a chapter on the relative safety of anæsthetics. There is also a re-arrangement of the chapters, and new matter appears in many of them. In spite of this, the whole work is kept within due bounds, and will, we think, admirably serve the purpose for which it was originally written. The author, in his position as teacher of anæsthetics in one of the general hospitals, found a need for a concise account of rules and methods, which could be placed in a student's hands. From a dental point of view, his opinions also interest us, and his position as anæsthetist at the Dental Hospital of London, enable him to speak with the authority of a specialist.

Under "general considerations," in the Introduction, we find the question discussed as to the advisability of using stimulants and narcotics. It seems that in this country, the administration of drugs before anæsthetising the patient, is rarely resorted to, except in operations upon the brain. In Chapter I. upon the choice of an anæsthetic, we have the reason for, or against, the use of the different agents in various conditions, summed up in a very convenient manner. The author states "the objections to ether are few in number, and a long experience in its administration has served to convince me that it is by far the safest anæsthetic we possess," and he thinks that gas, whenever possible, should be used as a preliminary to the ether. In the chapter upon Nitrous Oxide, the point we should pick out for criticism is, with reference to the amount of gas required for a single administration for dental purposes. A difference of opinion on such a matter is not of much moment, provided the patient has enough and not too much, but we should feel disposed to question the *necessity* of allowing from seven to eight gallons for each administration. We have, indeed, known a fifty gallon bottle suffice to produce satisfactory anæsthesia for twelve consecutive patients, and without using a supplemental bag.

The author figures and describes Clover's apparatus for the combined use of gas and ether, whilst for ether alone he invariably uses, and recommends to his pupils, a modification of of Ormsby's inhaler. The alteration consists in an enlargement of the bag, and the abolition of the valve and the tubes leading to the sponge, so that the ether is poured directly upon the sponge. Most interesting matter has been added to Chapter VI. which deals with the accidents which may occur during anæsthesia, and the proper treatment. We have not space, nor is it necessary, to allude in detail to the remarks upon the Hyderabad Commission, but we quote the following: "To my mind it signifies little, so far as choice of drug is concerned, whether chloroform kills by paralysing respiration or circulation first; the question is, which drug is more likely to produce a fatal effect. At any rate, the plan upon which I work is, to select ether for a patient (supposing chloroform and ether be equally suitable for the purposes of the surgeon) as the safer anæsthetic; and, I believe, the best method to adopt is to select our cases, and not blindly use one drug to the exclusion of the other."

Chapter VIII deals with local anæsthesia, and the index which has been added in this edition, completes a book, which constitutes, so far as a book can, a guide to the important subject of administration of anæsthetics.

The Medical Annual and Practitioner's Index. John Wright & Co: Bristol. 1892.

This Annual has now reached its tenth year, and appears to be still growing. It has a good array of contributors whose function is to extract and condense the latest information derived from the previous year's work. There is now a general index which takes over 20 pages of small type, whilst the main body of matter is arranged in different "parts," such as New Remedies, New Treatment, &c. Under each of these heads we have found allusions to dental matters, which, although not in themselves very profitable, show the range of subjects embraced. The use of carbolate of camphor as a local anæsthetic, to be introduced into the cavity of a carious tooth, might perhaps be of more value than "the smoke of the burnt seeds of Hyoscyamus Niger, conveyed through a paper tube to the hole in the tooth." But, apart from these, there are interesting allusions to neuralgia, tic doloureux and other subjects besides able articles by Dr. Armand Ruffer on Recent Advances in Bacteriology and by Mr. Andrew Pringle on Photography. Perhaps later on, it may be found advisable to admit a dental specialist to the army of contributors, in order to keep general practitioners posted with desirable information.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

SOLDERING OF GLASS AND PORCELAIN WITH METALS.

Mr. Cailletet has recently made known to the Société de Physique a process of soldering glass and porcelain with metals. Mechanists, physicists and chemists will appreciate the practical importance of this process, which permits of adapting any metallic object whatever (cock, tube, conducting wire, etc.)to experimental apparatus in such a way as to prevent any leakage even under high pressure.

The process is very simple. The portion of the tube that is to be soldered is first covered with a thin layer of platinum This deposit is obtained by covering the slightly heated glass by means of a brush, with very neutral chroride of platinum, mixed with essential oil of chamomile. The oil is slowly evaporated, and when the white and odoriferous vapours cease to be given off, the temperature is raised to a red heat. The platinum is then reduced and covers the glass tube with a bright layer of metal. On fixing the tube thus metallized, and placed in a bath of sulphate of copper, to the negative pole of a battery of suitable energy, there is deposited upon the platinum a ring of copper, which should be malleable and very adhesive if the operation has been properly performed.

In this state, the glass tube covered with copper can be treated like a genuine metallic tube and be soldered by means of tin to iron, copper, bronze, platinum, and all metals that can be united with tin solder.

The resistance and strength of soldering are very great. Mr. Cailletet has found that a tube of his apparatus for liquefying gases, the upp erextremity of which has been closed by means of an ajutage thus soldered, resists pressures of more than 300 atmospheres. The tube, instead of being platinized may be silverized by raising the glass covered with nitra of silver up to a heat bordering on red. The silver thus reduced adheres perfectly to the glass, but numerous experiments have caused platinizing to be preferred to silverizing in the majority of cases.—*La Nature.*

Abstracts of British & Foreign Journals.

THE ACTION OF PENTAL.

By Dr. JULIAS KOSSA, and HERM. NEUMANN, Budapest.

SOME years after the triumphs of ether and chloroform in Surgery, a new anæsthetic "Amylene," appeared, which in a short time attracted universal attention. In 1856 it became a popular anæsthetic and was employed by the most prominent surgeons, (Braun, Dumreicher, Schule, Dittel, and others), and in medical journals can be found a large number of interesting and essential observations, communicated by French and German writers.

Amongst the foremost was Snow, who found it very efficacious in small operations, and summed up its advantages thus :—

1. The narcotic action of Amylene is very quick, full intensity is produced after half a minute.

2. The narcosis is not very deep.

3. The action quickly vanishes so that when the dose is stopped the patient immediately regains consciousness.

4. The narcosis is not dangerous ; neither convulsions nor any unpleasant after effects are to be observed, and the patient has rather pleasant after-sensations.

Most of the observers entirely corroborated the remarks, but there were some, especially professors in Vienna whose results were not so favourable and who even denied the value of this new remedy.

Later on the same reports continued but in the course of the same year two cases of death were recorded, and it became apparent that the observers were working with preparations of different qualities. Duroy's statement of that time, of three different trials of Amylene showed a boiling point of from 30 to 62, whilst the pure "Isoamylene" has a stationary boiling point of 38° (according to others 35°). Recently "Amylene" was introduced into commerce by Mering in a purer form under the name of Pental. Different appellations such as "Trimethylethylene," "B Isoamylene," "Pental," and often also Amylene, refer to one and the same substance.

The paper gives the results of certain hypodermic injections of pental in animals. When pental is introduced into the stomach of the rabbit, there is very intense pain : the stomach expands to its utmost, the diaphragm becomes pressed up, and in consequence of this, respiration is impossible and the animal is soon suffocated. In a rabbit which received three cubic centimetres of pental, there was found a rupture of the cardiac end of the stomach, the mucous membrane was light grey, the whole coating was softened ; and along the great curvature subserous extravasations of blood, of considerable extent, were observed. This artificial rupture of the stomach at once recalled the experiments of Cl. Bernard who found the same thing in connection with ether. Half a cubic centimetre of pental injected into the jugular vein of the rabbit engenders dyspnœa and spasm ; the heart stops, there are a few respirations and in two minutes death ensues. Under the pleura there are found places where blood is suffused, in the lungs themselves there are extravations. The true action of pental is best shown when it is inhaled. If a frog is placed under a glass cover with cotton wool saturated with pental, it will be found that, after a short period of agitation the animal is stupified, its movements become heavy, sluggish, and awkward; when touched it, at first, moves slowly, afterwards not at all: it rests on the ground, lying upon its back and the breathing becomes slow. A small rabbit treated in this way shows the same symptoms of stupefaction. If one inhales pure pental (not mixed with air), the corneal reflex is abolished; by the inhalation of pental mixed with air this happens after a longer time. In frogs the corneal reflex often remains intact to the highest point of stupefaction. In rabbits, after inhalation of pental the pupil dilates but near the point of death it contracts again *ad maximum.* If now artificial respiration is introduced the pupil assumes its normal size on the inhalation of purer air. If pure pental is administered to a rabbit of medium size by means of a tracheal canula, death takes place after about two minutes, and the cause is due to suffocation; therefore animals can be saved by means of artificial respiration at the moment when breathing ceases. On a post-mortem, numerous extravasations are sometimes found in the lungs and there is no doubt that this circumstance can also contribute to the acceleration of death. The heart is the "*ultimum moriens*;" in every experiment the heart action outlives the breath; in one case the heart beat 16 minutes after cessation of respiration. The same thing has been noticed in numerous experiments with chloroform on rabbits, the sudden standing still of the heart, of which clinics so often make mention, never occurs; the beating of the heart always outlives the respiration, with chloroform. It is not decided upon what grounds to explain these singular circumstances. It is probable that the greatest part of these cases observed in man have a causal connection with a more or less pathological condition of heart. The paper describes other experiments in connection with the exposure of nerves and muscles to the direct action of pental. It was found that their irritability soon ceases. It was also tried as a local anæsthetic by means of a spray, and it was found that after using 10 cubic centimetres, the ear of the rabbit could be cut without causing pain. If, however, it is applied to the conjunctiva it has the same effect as Chloroform and produces great pain and inflammation. An account is also given of its action upon the blood and its corpuscles from which it appears that pental belongs to the active protoplasm poisons. It is certain that the hæmoglobin undergoes important chemical changes, but what the nature of the change really is only further research can decide. With regard to the temperature of the body, there is a very marked fall, and in connection with the changes in the respiratory system much stress is laid upon the greater importance of mixing plenty of air with pental than is necessary with even Chloroform and Bromethyl. With these two latter, the respirations in rabbits near death do not diminish, but are greatly accelerated, and gradually become more superficial until they are indicated upon the chart by a line.

Special attention was given to researches respecting the action on the heart, although Holländer has stated that he did not find either the respiration nor cardiac action affected. The authors found that the blood pressure fell, and that pental has a pronounced action on the heart, which is increased during inhalation. Thus, the heart-beats in a rabbit increased from 20 to 60 per minute, after some respirations. By means of a Ludwig-Kronecker manometer, the curves of a frog's heart show plainly that the contractions increase in number during the action of pental, the systole gradually becoming weaker.

Other experiments also made it evident that pental actually has an influence on the heart, and if less signification is to be attributed to this influence than in chloroform, it is only because the pental narcotic action is quicker and more superficial, and will be employed only in smaller and shorter operations and so not attain the full extent. But even in these cases it must be used with the greatest caution in lung and heart affections, as the old literature of amylene shows. Two cases of death, caused by amylene, are quoted in each of which the heart was diseased. In the first, a powerful man 33 years' old, on whom Fergusson operated for fistula in one, the respiration was affected in 5 or 6 minutes, and there was found emphysema and hypertrophy of the right ventricle. In the second, a strong man of 24, had a small tumour removed from the back, and here, too, death ensued and artificial respiration was in vain. The necropsy showed that the heart was "*morsch anamisch.*"

Finally there is a brief notice as to what becomes of pental in the organism. There is no doubt but that it is burnt up, at least partially, as carbonic acid and water. But another part, without undergoing decomposition, is separated as such at the lungs, as was shown in a rabbit, where pental was given internally, and its presence detected by the smell of the breath.

Vierteljahrsschrift für Zahnheilkunde.

PRIMARY DENTITION IN ITS RELATION TO RICKETS.

By George Carpenter, M.D., and R. Denison Pedley, L.D.S., F.R.C.S.

The authors allude to the widespread belief that the temporary teeth are materially affected in children who are rickety, and they give half-a-dozen quotations from text-books, which deal with this disease. There seems a general consensus of opinion that the enamel is defective, and that if the active phase of rickets becomes manifest at an early period, there are three ways in which the modifications may occur: 1.—The teeth are late in their eruption. 2.—They appear in their wrong order. 3.—They soon become carious, and are often shed early. The authors have for some time past, in their practice at the Evelina Hospital, had reason to doubt the correctness of these views in their entirety, and with the object of bringing them to the test they made more careful and extended observations on the subject. For this purpose, the mouths of 500 children, with obvious rickets, were examined, and the results are not confirmatory of the prevalent ideas on the subject. Briefly tabulated these results are as follows: A.—In the vast majority of patients the teeth are perfect in structure. There is no deficiency of enamel. The teeth do not become loose, and rapidly fall out. There is no special proneness to decay. B.—In those rare cases where the teeth have been found defective, a history of inherited syphilis has been obtained. C.—Dentition is undoubtedly delayed.

The result obtained under the last heading is, then, quite in accord with the writers quoted, and with the prevalent opinion, but in other respects it differs widely. A reference is made to the developmental stages of the teeth, and to the possibility of rickets commencing during uterine life. The opinion is expressed that a very large number of the children of the London poor, attending the out-patient room, must be slightly rachitic during the formation of the enamel. Accepting beading of the ribs as a diagnostic sign, it would follow that, if rickets is such a potent factor as the text-books state, some dental alteration in the shape of enamel scarring would have been detected in a considerable proportion of these cases, yet the contrary was the authors' experience. Over and over again they watched the eruption of teeth in obviously rickety children, who were attending as out-patients for weeks, yet their observations were not rewarded by the appearance of pitted and defective enamel; on the contrary it seemed quite perfect.

Although not regarding rickets as a syphilitic manifestation, yet syphilitic cachexia, when present, is a very powerful agent in the production of rickets, and in a large number of rickety children a syphilitic history can be obtained if enquired for. On this account, the authors do not, therefore, attach that importance to the heading B. which they might otherwise have done. What they claim, however, is, that it is not proven that rickets is responsible for all the dental troubles that have been laid to its charge; that the association of rickets with carious teeth as between cause and effect, is merely an assumption; and that caries does not take place in rickety children to anything like the extent the text-books would lead us to infer. What is wanted are some more extended and definite observations on this interesting point, and not statements which go the round of the various medical books in somewhat different dress, quite unchallenged, and accepted as truisms.

Lancet.

PEROXIDE OF HYDROGEN AS A THERAPEUTICAL AND BLEACHING AGENT.

By Dr. P. P. Starke, Richmond, Va.

Perhaps no remedy of recent notice, has attracted so much attention or realized so fully the expectations, as oxygen in some forms. The most notable feature in regard to oxygen is the entire freedom with which it may be used on the tissues of the body, without injurious effects, and that while it is held in the highest esteem by many it is condemned by none. This cannot be claimed for any other remedy. For all practical purposes we are surrounded by an atmosphere of oxygen to which we are, doubtless, indebted for the recovery from disease, and the healing of wounds. But experience has demonstrated that oxygen, at the moment of liberation from any of its compounds, having an unsatisfied affinity, is more active than in its free state as found in the atmosphere. Peroxide of hydrogen is a very unstable chemical compound, from which oxygen is readily liberated by contact with substances having an affinity for it. The most probable impurities to be found in it are sulphuric and hydrochloric acids.

When properly applied, it may be considered one of the most active, as well as harmless agents which we possess for sterilizing putrifying substances, after which it is without any further action on the tissues—in this manner differing from creasote, carbolic acid, bichloride of mercury, and any other antiseptics which depend on their poisonous property and caustic, irritating, effects for their antiseptic virtues, and are attended with danger in their concentrated form. It may be relied upon as the most valuable antiseptic and disinfectant in use in the treatment of abscesses, access being made first to the cavity of the abscess, and the hydrogen peroxide injected, and repeated till no reaction occurs, it cannot, of course be expected to cure an abscess at the extremity of the root, if merely placed in a crown cavity.

It is also useful as a bleaching agent for discoloured teeth, and has the advantage of being entirely harmless, and without chemical action on the structure of the tooth ; it is not irritating to the tissues of the mouth, does not itself produce another form of discoloration, and requires no special instrument for the introduction of fillings after its use, nor the removal of adjacent fillings to prevent chemical action on their metals with resulting stains. To obtain the best results from peroxide of hydrogen, the following points should be borne in mind: 1.—That it should be kept in glass stoppered bottles at a temperature not higher than 70° F., though when diluted it may be kept at a higher temperature without being decomposed. 2. The presence of acids retards, and of alkalies hastens, its action. 3. That its action is quickened in proportion to its concentration, and that if used in very small strength for bleaching it may require a long time. 4. The most common impurities being sulphuric ond hydrochloric acid the sulphuric may be detected by the addition of a small quantity of baryta water, and the hydrochloric by a solution of nitrate of silver, when, in either case, a white precipitate will be formed if the acid indicated be present. 6. That when used in abscesses and other diseased conditions it should be carried to the parts affected, as unlike creasote and carbolic acid it posseses no curative powers when applied to remote parts as a counter irritant. 7. It should be reapplied as long as bubbles of gas are given off.

Southern Dental Journal.

MECHANICAL TREATMENT OF CONGENITAL FISSURE OF THE PALATE.

By Grant Molyneaux, D.D.S., Cincinati.

The author first refers to some conditions which exist during vocalization, with a normal and an abnormal palate, so that the principle upon which mechanical treatment is based may be better understood.

It is necessary for perfect enunciation that the cavity of the nose should be perfectly separated from the mouth and pharynx, except for the sounding of the two consonants M and N. This separation is ordinarily effected by the soft palate acting in conjunction with the superior constrictor muscle of the pharynx.

In congenital fissure of the palate, which is the only lesion that can properly be called cleft palate, there is a permanent communication between the three cavities mentioned, and the degree to which speech is impaired, depends largely upon the character and extent of the fissure. The treatment consists of the substitution of various appliances in the line of the fissure so as to utilise such muscular action as is available to close and open the posterior nares during vocalisation. The extension backwards of the soft palate to meet the superior constrictor, is caused entirely by the palato-pharyngei muscles, and as the soft palate strikes the wall of the pharynx its lower edge is turned forward, thereby presenting a convex nasal surface to the pharyngeal wall and closing the nares as in swallowing. Now when the expired air is thrown into vibration, and a tone produced, the tensor and levator palati muscles are called into use, their function being to straighten and make tense the palate by pulling against each other laterally; this tension being possible only when the palate is intact, and drawn backward by the palato-pharyngei muscles. This tense palate, which might be likened to a drum head, is now capable of entering into a sympathetic vibration and adds quality to the tone produced. The levator and tensor cannot close, or cause to be closed, the posterior nares.

A point worthy of notice is that the vowel sounds can be distinctly enunciated without a perfect closure of the posterior nares, though for purity of sound it is better that it should be closed. When there is a fissure of the palate the tensor and levator palati have lost their functions, and the palate can be made neither tense nor straight. On the contrary, by virtue of the palato-pharyngei, which are fully developed, the palate is pulled downward, and at the same time is drawn backward, and the ends of the uvulæ brought nearer each other so as to touch at times. The superior constrictor of the pharynx is also as fully developed as normally, and in every effort to swallow, or enunciate, it exhibits the same uniform contraction as with the normal palate. Süersen, of Berlin, was the first to call attention to the action of this muscle in connection with treatment of cleft palate and based the construction of his appliance upon it.

The clinical features of cleft palate are by no means uniform, and the cleft may vary from a simple slit in the soft palate to various extents in the hard palate, and sometimes pass entirely through the soft and hard, with complete loss of the intermaxillary bone, and the four incisor teeth. In width the cleft may vary from a quarter of an inch between the edges of the extremities of the soft palate to one and a quarter inches. The distance between the opposing pillars of the fauces, or opposite the tonsils varies in different individuals ; as also does the distance between the terminus of the soft palate, and the posterior pharyngeal wall. In mechanical treatment of cleft palate, it is necessary to establish an artificial valve that can close the opening into the nose at will. This can only be accomplished speedily and definitely, and for all classes of cases, by constructing an appliance that will fill the fissure in the palate, at the same time projecting above and beyond the soft palate, into the pharynx, and of such dimensions that the natural contraction of the superior constrictor of the pharynx will meet the appliance and form a joint with it. The author then alludes to the various sounds in articulation, and the exercises which he recommends in the training for proper voice production.

With regard to the pharyngeal portion of the mechanical appliance, it is a strange fact that while so much is claimed for it, none of our writers give any idea of how to obtain its proper size and shape, although we are told how, by most intricate processes, to get an impression of the floor of the nares, a part that is of no service with any form of appliance. Dr. Süersen is the only person who mentions the necessity of taking an impression of the pharyngeal cavity. His method was to vulcanize an ordinary plate, and upon a bar projecting from a plate into the pharynx, build gutta-percha until he had filled the cavity. This operation required about two weeks, at various sittings, to obtain the marking of the pharyngeal cavity. The appliance with which the author has been most successful is a modification of the " Süersen," which does not in any way detract from the value of the original, but simplifies the construction, and at the same time gets rid of many disagreeable features that it possessed. The body of the impression tray is of modelling compound, and follows the outline of the palate, extending into the fissure as far as the terminus of the soft palate, but touches no part of the mouth except the cutting edges of the teeth ; this provision ensures the same position however frequently the tray is placed in the mouth. At the back part is a wire bent to the general outline of the pharynx about a quarter of an inch from the posterior and lateral walls. It extends low enough to touch the tongue in swallowing, and is twisted and fastened in the modelling compound above and behind the soft palate. The obturators are not made hollow, but in the form of a thin shell with the upper part removed. If there is a horizontal or convex surface the mucus collects upon the appliance and can only be removed by taking it from the mouth. If left open and the edges slightly turned toward the medium line, the mucus is confined to the narrow space between the appliance and living tissue, and can be removed by the ordinary methods. By making the appliance detachable every part can be kept clean easily, and repairs, if necessary, can be proceeded with as in a simple case. The paper is illustrated by figures showing the methods employed, and other points in connection with the author's apparatus.

The Dental Review.

Dental News.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

To be held in Chicago, August 17th to 27th, inclusive, 1893.

Chairman, Dr. W. W. Walker, 67, West 9th Street, New York City. *Treasurer*, Dr. J. S. Marshall, Argyle Building, Chicago, Ill. *Secretary*, Dr. A. O. Hunt, Iowa City Iowa.

Executive Committee,—Dr. L. D. Carpenter, Atlanta, Ga; Dr. J. W. Crawford, Nashville, Tenn; Dr. W. J. Barton, Paris, Texas; Dr. J. Taft, Cincinnati, Ohio; Dr. C. S. Stockton, Newark, N.J.; Dr. L. D. Shepard, Boston, Mass., Dr. W. W. Walker, New York City; Dr. A. O. Hunt, Iowa City, Iowa; Dr. H. B. Noble, Washington, D.C.; Dr. Geo. W. McElhaney, Columbus, Ga.; Dr. J. C. Storey, Dallas, Texas; Dr. M. W. Foster, Baltimore, Md.; Dr. A. W. Harlan, Chicago, Ill.; Dr. J. S. Marshall, Chicago, Ill.; Dr. H. J. McKellops, St. Louis, Mo.

General Finance Committee,—Dr. L. D. Shepard, 330, Dartmouth St., Boston, Mass., *Chairman*; Dr. A. L. Northrop, 57, West 49th St., New York; Dr. T. W. Brophy, 96, State St., Chicago, Ill.

The following letter has been circulated :—

Dear Doctor :—

As you are doubtless aware, by the concurrent action of the Southern Dental Association, July, 16, 1890, and of the American Dental Association, August 5, 1890, it has been decided to hold in Chicago, in 1893, a World's Columbian Dental Congress.

Each Association appointed five men from its own membership, and each Association voted "that this Joint Committee have power to fill all vacancies, and shall add to its membership either one, three or five more members, as it may deem advisable, and when this Committee is so completed it shall be clothed with full power to take such action as in its judgment it may deem best for creating an organization for the purpose of holding a dental meeting in Chicago in 1893, which the reputable dentists throughout the world shall be invited to attend, and that any action that this Committee may take in the premises shall be final and binding."

The Southern Association appointed Drs. Carpenter, Crawford, Barton, Taft and Stockton. The American Association appointed Drs. Shepard, Walker, Hunt, Noble and McElhaney. The Joint Committee elected Dr. Storey, retiring President of the Southern Association, Dr. Foster, retiring President of the American Association, and Drs. Harlan, Marshall and McKellops ; and so completed the Committee.

The General Executive Committee, thus appointed and empowered, at its first meeting at Excelsior Springs, in August 1890, elected as Chairman, Dr. W. W. Walker ; as Treasurer, Dr. J. S. Marshall ; as Secretary, Dr. A. O. Hunt ; and as General Finance Committee, Drs. L. D. Shepard, A. L. Northrop and T. W. Brophy. It has held meetings at Washington, January, 1891, at Saratoga Springs, in August, 1891, and at Chicago, in January, 1892. The next meeting will be held at Lookout Mountain, in July, 1892.

The Committee has transacted a great amount of business, and with remarkable harmony and unanimity. As an illustration of its devotion to the trust committed to it by the two great Associations of the country, all but two of its members were present at the recent mid-winter three days' meeting in Chicago. As a further illustration of its intention, it has voted "that any member of this Committee having failed to attend three successive meetings, without a satisfactory explanation, will be considered to have vacated his position on the Committee."

The work of the Committee so far has been largely preliminary, a detailed statement of which will be given to the profession through the journals.

The General Finance Committee has prepared this statement in advance of such publication, that those who are asked to assist it as State Finance Committees may know what has been done and what will be expected of them, so that in accepting appointments each may do it intelligently, and for the use of the State Finance Committees in soliciting subscriptions.

It is expected that papers and reports of great interest and value will be presented in such numbers and volumes that the transactions will make two or three large books. It is hoped that there will be funds to print and illustrate these transactions in as full and perfect a manner as is possible, and so make the books an indispensable adjunct to the dental library and working text-books of every dentist who aims or claims to be an educated man.

As an illustration of the scope and breadth of the investigations and productions of the Congress, the following Committees have been voted, most of which are already filled and the Committees at work:—

1. A General Finance Committee.
2. A Programme Committee.
3. A Committee on Exhibits.
4. A Committee on Transportation.
5. A Committee on Reception.
6. A Committee on Registration.
7. A Committee on Printing Transactions.
8. A Committee on Conference with State and Local Societies.
9. A Committee on the History of Dental Legislation in this and other countries.
10. Auditing Committee.
11. A Committee on Invitations.
12. A Committee on Membership.
13. A Committee on Educational and Literary Exhibits.
14. A Committee on Clinics in Operative Dentistry and Oral Surgery.
15. A Committee on Prosthetic Dentistry.
16. Local Committee of Arrangements.
17. A Committee on Essays.
18. A Committee on History of Dentistry in the United States.

19. A Committee on Nomenclature.

20. A Committee to promote the appointment of Dental Surgeons in the Armies and Navies of the World.

21. A Committee to devise means for the care and treatment of the teeth of the poor.

22. A Committee on Microscopy and Bacteriology.

23. A Committee on Prize Essays.

This completes the list of Committees so far as voted. There will doubtless be others, for it is intended to cover the whole ground of Dental Science and Art. From an examination of the list it will be seen that Committees Nos. 1, 2, 4, 5, 6, 10, 11, 12, and 16 are principally business Committees, while Committees Nos. 3, 7, 8, 9, 13, 14, 15, 17, 18, 19, 20, 21, 22 and 23 are purely scientific.

To illustrate the work planned, Committee No. 8, styled Committee on Conference with Local and State Societies, under the general chairmanship of Dr. J. Taft, consists of a State Committee from each State of three to seven members, each State Committee working under its Chairman and Secretary, and making a total membership of about two hundred. Each State Committee among other duties is asked by Dr. Taft to—

Fourth. Procure a History of Dentistry in your State, giving account, so far as you can, of the pioneers, those who first practised in your State, and the date, and any matters of interest pertaining to the same.

Fifth. Give the number of dentists in your State, also the Dental College graduates. Also give number of honorable practitioners, so far as feasible.

Sixth. How many Dental Societies, all told, are there in your State, and what is the membership of each? How many dentists in your State have membership in Societies outside of your State?

Seventh. How many in your State have added anything of value to the literature of dentistry, and in what way? And by whom?

Eighth. What discoveries and improvements, in modes of practice, instruments, appliances or materials, have been made by dentists in your State, and by whom?

Ninth. What influence has the law regulating the practice of dentistry had upon the profession in your State?

Each State Committee is expected to do the work for its own State in as full and complete a manner as possible, and prepare a report for that State "upon the status and condition of the profession, past and present, that may give, at least, a proximate idea of its growth, resources and power." Then all these statistics and material are to be turned over to Committee No. 18, as an authentic basis for its work of preparing a History of Dentistry in the whole country. Committee No. 18 consists of,—

J. Taft, Cincinnati, Ohio ; Louis Jack, Philadelphia, Penn.; F. T. Van Wort, Brooklyn, N. Y. ; F. J. S. Gorgas, Baltimore, Md.; H. L. McKellops, St. Louis, Mo.; E. G. Betty, Cincinnati, Ohio ; J. B. Patrick, Charleston, S. C.

By vote, the Chairman of this Committee is "allowed to add to this Committee any person or persons that he may deem proper and of advantage." One can hardly realize the value of the results of the work of Committees No. 8 and 18.

It has been voted that the membership fee shall be ten dollars. To be collected only from residents of the United States.

It has been voted "that the membership shall consist of legally qualified and reputable dentists (as defined in the Code of Ethics of the American and Southern Dental Associations) residing in the United States, and all foreign dentists regularly qualified by the laws of the countries from which they come, and such other scientific persons as may be invited by the Committee on Invitations" (Committee No. 11).

It will be seen that the doors are open to every reputable dentist in the United States. All will be welcome except those who are illegal practitioners in States having laws, or who are violators of the Code of Ethics. Should any join, or attempt to join, and it is known, the name of such applicant will be referred to the Membership Committee. It is advised that no subscription involving any right of membership be received by the State Finance Committees from such as are known to be ineligible to membership.

The General Finance Committee submitted to the Executive Committee the following plan and it was unanimously voted that such plan should constitute the "rule of action":

Resolved,—That the General Finance Committee be authorized to guarantee to contributors who would be eligible to membership as follows :

First. That every contributor of ten (10) dollars shall receive the transactions if he does not attend, but will be expected to pay the membership fee of ten (10) dollars in addition, should he attend the Congress.

Second. That every contributor of twenty (20) dollars shall receive the transactions of the Congress if he does not attend, and if he attends and joins the Congress, his receipt for contribution shall be accepted by the Treasurer as full payment of the membership fee of ten (10) dollars.

Third. That every contributor of thirty (30) dollars or upwards shall have all the advantages of the contributor of twenty (20) dollars, and in addition shall receive free the Commemorative Medal which will be struck.

From the foregoing it will be seen that the solicitor for contributions can assure each contributor of ten dollars or upwards that he will receive a substantial return, whether he attends or not.

To accomplish all this work will demand a large amount of money. The items of stationery, printing and postage will call for considerable ready cash, which must be advanced by those doing the work, in addition to their generous and gratuitous labour, or be furnished, by the prompt, liberal and patriotic contributions of the dentists of the whole country. Careful estimates place the amount to be contributed in advance of the Congress at thirty thousand dollars.

It is judged by all who are conversant with the work done up to the present time that this Congress will mark an epoch in dental progress and be the largest in numbers and most valuable in results of any dental meeting ever held.

The General Executive Committee feels that a great trust has been committed to it, which it will endeavour to manage in a broad and liberal spirit.

The General Finance Committee has perfect confidence that the profession will respond promptly and generously to its call for contributions to ensure the success of the Congress and the honour of American dentistry.

The receipt which the Treasurer, Dr. J. S. Marshall, will mail to each contributor, will have printed on it the condition before mentioned as part of the contract between the congress and each contributor.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following were the questions in the papers at the Examination for the L.D.S. Diploma, held May 9th, 1892. 2 to 4 o'clock, p.m., and 5 to 8 p.m.

N.B.—The candidate is required to answer at least one of the two questions, both on Anatomy and Physiology, and on Surgery and Pathology, and at least two of the three questions, both on Dental Anatomy and Physiology, and on Dental Surgery and Pathology.

Anatomy and Physiology.

1. Give the course of the Blood from its entrance into the right side of the Heart to the Aorta; explain the action of the Valves of the Heart.

2. Give the origin of the two Pterygoid muscles, with their Nerve-supply.

Surgery and Pathology.

3. Describe the pathology of an Alveolar Abscess; give its symptoms and treatment.

4. Give the causes and treatment of Hæmorrhage from the Gums and Jaws.

Dental Anatomy and Physiology.

1. Mention briefly the general characters of the dentition of Fishes. As examples, describe the teeth of Pristis and of the Pike.

2. Describe the Alveolo-dental membrane. Whence does it originate, and what purposes does it serve during the growth and after the completion of the Tooth?

3. Describe closely the articulation of the upper with the lower teeth in Man. What are the ordinary and extreme movements of the Lower Jaw, and how does the temporo-maxillary articulation provide for them?

Dental Surgery and Pathology.

1. Why should you hesitate to relieve crowding of the incisors in a child by extraction of temporary canines, (*a*) in the Upper, (*b*) in the Lower Jaw? Under what circumstances would you recommend it?

2. What is Dental Exostosis? When would you suspect it, and how may it be diagnosed? What are the microscopic characters of the Tissue?

3 Write prescriptions for—
   - (i) A Tooth Powder.
   - (ii) A Wash for use in a much wounded mouth.
   - (iii) Anodyne applications to relieve pain after tooth extraction.
   - (iv) Use in Ulcerative Stomatitis.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The following gentlemen having passed the requisite examinations, were admitted Licentiates in Dental Surgery of the College:—William Guy, Kent; Frederick John Turnbull, Edinburgh; William Williams, Beaumaris, and Thomas Evans Johnston, Carnbee, Fife.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the May sittings of the Examiners of the Dental Board, the following candidates passed the first examination for the Dental Licence:—

Ezekiel Agnew, Glasgow; Charles H. Carrington, Manchester; Thomas Duncan, Glasgow; Andrew M. McCush, Glasgow; James Summers, Glasgow. Two candidates were referred

At the final examination William D. Anderson, Glasgow, passed in the Dental Subjects, and on his being qualified in Medicine and Surgery will be admitted a Licentiate. Two candidates were referred.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The following were the questions set at the Dental Examination at the Royal College of Surgeons in Ireland, May, 1892.

Anatomy.

1. Mention the different classes of teeth. Describe their anatomical elements and microscopic features.
2. Describe the development of a tooth.
3 How many deciduous teeth are there in a child of four years?
4. Describe the process of mastication, and enumerate some of the muscles in the process, giving their origin and insertion.
5. Give the origin and insertion of the external pterygoid muscle and its arterial supply.

Surgery.

1. Define the term "fracture," and give a classification of fractures.
2. What is hæmorrhage? How would you proceed to arrest it in the following cases—(*a*) a wounded artery; (*b*) a ruptured varicose vein; (*c*) a tooth socket.
3. What are the symptoms of disease of the lower jaw-bone?
4. Describe a case of cellulitis of the neck.
5. What is an aneurism? and what varieties are met with about the face?

Dental Metallurgy.

1. What are the distinctive properties of a metal?
2. Under what conditions will the contact of two fillings produce a current of electricity?
3. Distinguish between a metallic sulphate, sulphite, and sulphide.
4. What salts of zinc are used in dentistry, and how are they obtained?
5. State approximately the composition of brass, gun metal, bell metal, Babbit metal, Spence's metal.

Dental Surgery.

1. What preparation would you use to bleach teeth? Write two or three formulas.
2. Name some of the deformities of the jaws, and describe one of them.
3. Name some of the principal germicides. Write formulas for dental use.
4. What is a fistula? Give cause and treatment.
5. Inflammation of peridental membrane; classification and treatment.

The following gentlemen having passed the necessary examination, have been admitted Licentiates in Dental Surgery of the College:—John Hutchinson Edward, Manchester, and James William Smith, London.

OBITUARY.

Felix Weiss, L.D.S. Eng.

Our readers will share with us the regret with which we record the sudden death of this well-known practitioner, which occurred on the 22nd ult., at 7, Cavendish Square, and will wish to join in an expression of sympathy with the family circle left to lament his loss. Mr. Weiss for years contributed largely to the pages of this Journal, and was a most enthusiastic advocate for dental education, and the principles of high professional conduct, when such advocates were much needed.

Mr. Weiss was born in Liverpool in 1822, and was articled to a Pole named Yaniewicz, a successful dental practitioner of that city. He came to London in 1843, and was associated with the College of Dentists. He was one of the half dozen who joined the Odontological Society on the dissolution of the former body, and he served the various offices of Councillor, Librarian, Vice-President, and, finally, President of the Society. He was also a Vice-President of the British

Dental Association, and a frequent attendant at the various professional meetings. Under the *non-de-plume* of "Phospher" he contributed to the different Dental Journals, and was, besides, the author of several works of fiction, amongst which may be mentioned "Vernon Galbray," portraying the life of a dental charlatan. He was an old sufferer from rheumatism, and his powers of locomotion were somewhat limited, but his health had recently been much better than it had been for years, and he was present at the last meeting of the Odontological Society, with a bright, clear eye, and a lively interest in all that was going on.

With his departure, full of years and professional honours, we lose an earnest worker, but his name will remain one of the landmarks in the history of dental progress.

APPOINTMENT.

A. A. Matthews, L.D.S., has been appointed Honorary Dental Surgeon to the Bradford Infirmary.

VACANCIES.

Victoria Dental Hospital of Manchester, Grosvenor Street, All Saints. The post of Demonstrator of Operative Dentistry is vacant. Applications to be made to the Dean.

Victoria Dental Hospital of Manchester, Grosvenor Street, All Saints. The post of House Surgeon will shortly be vacant. Applications to be made to the Honorary Secretary by the 13th June.

The Dental Hospital of London, Leicester Square. There will be a vacancy for Demonstrator. Applications to be made to the Dean on or before the 4th July.

The Dental Hospital of London, Leicester Square. The post of Dental Surgeon is vacant. Applications to be made to the Secretary by 13th June.

British Journal of Dental Science.

No. 586. LONDON, JUNE 15, 1892. Vol. XXXV.

PYORRHŒA ALVEOLARIS.*

By W. J. Fisk, L.D.S., Edin.

Mr. President and Gentlemen, I wish this evening to make a few remarks on a subject, which in a practical form, must often have come under our notice in hospital and private practice, and which, next to caries, is the most formidable condition from a dental point of view that we have to treat.

It is a disease, which is not confined to any sex, may occur at any age, although more general at middle life, either in people of apparently robust health, or in those of weakly constitution ; any number of teeth may be affected, or sometimes only a single one. The course of the disease varies ; in some, the symptoms are well-marked, there is a considerable amount of pain, some again, are only aware of the teeth loosening, and beyond that fact, they suffer no inconvenience whatever. It is apparently on the increase, and considering its disastrous results if left unchecked, it is important that we should get all the information possible as to the disease and its cause, so that we may be better able to cope with it, when it comes under our notice for treatment.

One name of this disease is Pyorrhœa Alveolaris. It is a suppurative inflammation of the periosteum, with more or less severe inflammation of the gums, and necrosis of the alveolar process of the diseased teeth, resulting in wasting of the sockets, and shedding of the teeth.

The symptoms commence with a slight redness at the neck of the tooth, which cannot be distinguished from a simple inflammation such as is often due to the presence of tartar.

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* Read before the National Dental Hospital Students' Society, May, 1892

Generally at this stage tartar is present, but not always. As the disease advances, definite symptoms appear, the inflammation extends deeper into the substance of the gum, which becomes more or less swollen and congested, and of a purple, or dark red colour. The gum is now seen to be loosely connected with the necks of the teeth, and there is formed between them and the gums, a sulcus from which, on pressure, comes a discharge of pus. As the process advances, the margins of the alveolar processes are involved, and this is followed by the destruction of the thicker parts, and consequently, loosening of the teeth.

The superior and inferior front teeth when affected, are seen to be separated and protruded, the gum being of a purple tint, and an offensive discharge welling up round the necks of the teeth on slight pressure being applied to the gums. If neglected, the gums may become hypertrophied, or they will gradually recede, with the result that the roots are to a greater or lesser extent exposed, the loosening of the teeth increases, and they either have to be removed, or else they drop out. In the great majority of cases the denuded roots are found to be partially covered by a deposit of tartar in the form of nodules. On some, tartar is deposited in large masses ; with others, on the other hand, an examination of teeth will sometimes show that there is no deposit whatever on the roots of the teeth. It is important to remember this, because there are some who hold the opinion that the chief local cause of the disease has been the presence of a foreign body deposited on the roots of the teeth.

It sometimes happens that the swollen condition of the gums is absent, in fact, few inflammatory symptoms present themselves ; the gum remains well up to its proper position at the neck of the tooth, yet the destruction process is quite as severe, the socket becoming gradually destroyed, the eventual result being the loss of the tooth. Sometimes the symptoms are of such a mild type as not to be noticed at a casual glance, and give no inconvenience to the patient until the looseness of the teeth becomes so marked as to be noticeable. In cases which are seen at an early stage, if any doubt exists as to the existence of the disease, the application of peroxide of hydrogen on a little cotton wool pushed beneath the gum, will enable us to detect the presence of pus, which is characteristic of pyorrhœa alveolaris. Usually, however, the disease is readily recognised, having well-marked symptoms, and being accompanied with more or less neuralgic pain.

The interval of time between the first appearance of the disease, and loss of teeth varies ; Dr. Miller quotes a case on the authority of the patient's own statement, in which after the commencement of the loosening of the teeth, all superior incisors were lost in three weeks, two fell out, the others had to be removed.

From personal observations in a few cases, I should put the time down at from two to five years. I have also noticed the disease to be more general amongst females between the ages of twenty and thirty years. Pyorrhœa alveolaris often attacks children. Dr. Miller examined the mouths of over one hundred patients who were inmates of an asylum for scrofulous children, and discovered several typical cases. In that of a boy, 9½ years of age, with advanced dentition, he found the left inferior first bicuspid so loose that it could be pushed backwards and forwards with the fingers, the alveolus discharging pus profusely under pressure! He also noticed a case where the superior incisors of a girl only 4 years of age, were extremely loose, the gums had receded and were very red and suppurating exhibiting all the symptoms of pyorrhœa.

Is the disease contagious? I have, in the few cases that have come under my notice, not seen a single one in which one member of a family has infected another. It would require some statistics of cases in order to clear this point up. I can recall about six cases where either wife or husband was subject to it, but not both ; we should expect if it was very contagious, that both would be affected.

Is is a constitutional, or local disease? This is a much debated question, and one on which great difference of opinion exists. Dr. Riggs held, that it was purely a local infection, requiring local treatment ; on the other hand, gout, rheumatism, tuberculosis, scrofula, dyspepsia, and all wasting diseases have been put down as predisposing causes. Mr. Bland Sutton holds a view that the disease is of constitutional origin, and its connection with wasting diseases has been given by some as evidence in favour of this view. Dr. Taft holds that pyorrhœa arises in consequence of general disorder of health, and that local treatment is useless, unless the general state of health is improved. Magitôt, whose opinion is of weight, makes the following propositions :—

(1). The affection characterized by alveolar suppuration, and by loosening and falling out of the teeth, should be designated as a true symptomatic alveolar arthritis which is septic and contagious.

(2). It generally arises under the influence of certain unfavourable conditions of health and diathesis, also in exanthematic fevers, etc., where it manifests itself either as a complication, or as a consequence.

(3). The therapeutics should consist chiefly in the application of antiseptics, local alternatives, astringents, or caustics.

Mr. Roughton, who has given some attention to this subject, has made some cultivations of bacteria from cases of pyorrhœa, which possibly some of you may have seen; I hope that at an early date, he will favour this Society with the results of his investigation.

Dr. Miller, of Berlin, has also, in his work on the micro-organisms of the mouth, given the results of his culture experiments; he succeeded in cultivating a large number of bacteria of pyorrhœa alveolaris, which possessed pyogenic properties, but was not able to determine the constant occurrence of any particular one which might be defined as a specific micro-organism, and stained sections of his specimens, show masses of different bacteria. He also says, as regards the participation of bacteria in pyorrhœa alveolaris, our present knowledge of suppurative inflammations compels us to consider bacteria as the cause of the suppurations incident to this disease. Micro-organisms which possess pyogenic properties temporarily, or permanently, inhabit every mouth. If, therefore the power of resistance of the peridental tissue be impaired by any one of the above-mentioned local or constitutional causes in such a manner as to furnish a suitable culture medium for the bacteria, they will, of course, begin their ravages, and the usual symptoms will follow.

Analogous circumstances are noticed in other parasitic diseases of the oral and pharyngeal cavities.

According to this conception, pyorrhœa alveolaris is not caused by any specific bacterium, which occurs in every case, (like the tubercle-bacillus in tuberculosis), but various bacteria may participate in it, just as in suppurative processes not only one but, generally, various species have been found. Besides, as far as we know, there is no bacterium, which inoculated under the gums, is able to provoke the disease in healthy persons.

The presence of bacteria of various sorts in the pus of pyorrhœa alveolaris can be easily proved by the following simple process.

Take a sterilized micro cover glass, put on it a droplet of water, to this add a very little of the pus, evaporate the moisture slowly at some distance from a Bunsen flame, now pass through the flame rapidly twice to coagulate the albumen.

Put a drop or two of some aniline stain on the preparation, and let it stay for about half a minute, wash off with distilled water rapidly,remove all moisture with blotting paper,and again dry thoroughly. Now mount in Canada Balsam, and examine under the microscope (high power), and various forms of bacteria will be seen.

In considering the treatment of this disease, we must first of all, in our own minds form an opinion as to its etiology; constitutional causes of course would not be for us to treat, as they come under the care of the medical attendant of the patient. To my mind, it appears that the weight of evidence is in favour of its being a germ disease, and I think that whatever may be the predisposing cause, the direct one is the action of micro-organisms. We have three stages to treat, first, that of inflammation at the margin of the gums; secondly, the condition which exists when the gums are swollen, and there is necrosis of the margins of the alveolus with, or without the presence of a calcareous deposit on the roots; and thirdly, when, owing to the destruction of alveolus and periosteum, the teeth have become so loosened, that they are a trouble to the patient. In each case, the presence of pus is demonstrated on applying pressure to the gums.

In the first stage, it is advisable to use a solution of Bichloride of Mercury, 1 in 500 to 2,000, either in peroxide of hydrogen water, or alcohol; I have found from personal experience that patients suffer less pain from the alcoholic solution. It is best applied with a syringe, and the part beneath the margin of the gums, must be well syringed out if the treatment is to be effective; if, however, the sulcus is large, it can be applied on cotton wool at the point of an instrument; this part of the treatment ought to be carried out thoroughly twice a day, the solution remaining in contact with the diseased tissue at least three minutes at each operation. The patient under the care of Mr. Roughton, whose case was mentioned at the last meeting of the Students'

Society, gave up at least two hours every day to the application of Bichloride of Mercury. The teeth should then be thoroughly cleansed, and the patient should be impressed with the necessity of keeping them in good condition. The gums can be treated with aromatic sulphuric acid or glycerine and tannin.

If this treatment is carried out systematically, an improvement will show itself in a short time.

In the second stage, the most important operation, after the germicidal injection, is the removal of all deposits from the teeth, and also of all necrosed bone. This operation requires to be very carefully performed, not only because of its great importance, but also owing to the pain which attends it. It is better to extend the operation over several sittings ; by so doing, we shall ensure the complete removal of tartar and necrosed bone, with less suffering to the patient. The bulk of the deposit will be removed with ease, the chief difficulty will be in the removal of the last particles of the calculus. In many cases, there will be found small incrustations of slight thickness, lying closely and smoothly at the root of the tooth, over which an instrument might pass without removing, or even detecting them. These are generally of a dark colour, and if they can be uncovered, can be easily seen. Dr. Gilmer has proposed a plan, which will, in his opinion, assist the operation ; it is to pack salicylized cotton under the free margin of the gum, and to allow it to remain for 24 hours, its expansion causes the gum to stand away from the tooth, so that small scales may be seen. Dr. Riggs, who first described this disease, claimed that the edge of the bone was always in a state of disintegration, and that it should be scraped so as to get a fresh surface; he designed a special set of instruments for that purpose, having the cutting edges variously arranged so as to keep a sharp point always, and a sharp edge towards the tooth, while there is a safe side towards the gum, this is passed down parallel with the root, and the point used to scrape the bone. We can all understand how necessary it is for the necrosed bone to be removed as thoroughly as possible. After this operation, sulphuric acid should be applied by means of a piece of cotton wool on an instrument, or piece of wood, well down the roots of the teeth, the object in using this, is to stimulate the reproduction of new bone ; astringents should then be applied to the gums round the neck of the teeth, Sulphate of Copper, Tincture of Myrrh, Chloride of Zinc, Chlorate of Potash, are all very useful.

In the last stage, when the teeth are very loose, and the bone and periosteum have been destroyed, it is better I should think to extract them ; you may certainly, in given cases, by the aid of ligatures, or some mechanical appliances, retain them, but unless they can be restored to a position of usefulness it is better for the patient, that they should be replaced by artificial substitutes. Tomes has found that frequent and vigorous rubbing of the gums with the finger, shampooing in fact, has often been productive of great advantage : he quotes Dr. Atkinson, who advises, when the recession is great, and dark bloody pus is exuding, that a caustic paste, made by rubbing together equal parts of carbolic acid, and of caustic potash without any water, be passed down to the bottom of the pouches. Sulphate of Copper is largely advocated as a remedy for Pyorrhœa Alveolaris.

Dr. Miller advises a thorough cleansing of the roots of the teeth, which he says, can only be performed after making an incision in the gums, over and parallel to each root, and extending at least to the line of demarcation between the healthy and diseased tissue, if then a tampon of cotton wool is placed in the incision, the flaps of gum will be pressed apart, and in a few hours, the roots plainly exposed to view, the removal of the deposit to be followed by an application of nitric acid, 2 to 4 per cent; the teeth are to be kept thoroughly clean, and any pockets between gum and roots are to be syringed out with an antiseptic solution after every meal.

All authorities in the treatment of this disease express a doubt as to the permanent results of treatment. The most unfavourable cases are in my opinion those in which the deposit of tartar is very slight, if any, with apparently little alteration in the condition of the gums, which remain well up to the necks of the teeth, and the discharging pus being of a light cream colour ; yet the treatment will undoubtedly prolong the lives of the affected organs, and restore to usefulness, for a few years, teeth, which if neglected, would be a source of pain and discomfort.

After-treatment is strongly to be advised, and just as we all feel the necessity of examining teeth periodically to enable us to keep caries in check, so it is important that we should at intervals of weeks, then months, examine the condition of patients who suffer from this complaint, so that we may be able to treat any return of the symptoms.

Certain methods of treatment have each their advocates ;

to give you a description found in the literature of the profession, would take too long a time. I suggest that if it is a germ disease, the first thing to do is to destroy the organisms, and what better germicide is there than Bichloride of Mercury?

Necrosed bone, and calcareous deposits, under any circumstances ought to be removed, the inflammatory condition of the gums to be treated by astringents. This disease of Pyorrhœa Alveolaris is gradually coming to the front as a subject for discussion ; considering the mischief it causes, it is essential for all dentists to be thoroughly well informed.

That the discussion, which I hope will follow the reading of this paper, may help us in that direction, is my desire.

THE TREATMENT OF CHILDREN'S TEETH.*

By G. Kershaw.

Gentlemen,—The subject allotted to me for my paper this evening, is one which demands, if justice be done to it, a far larger experience than that which I have at my command, and, therefore, I beg of your forbearance and patience, whilst listening to what I am afraid will be a very inadequate paper.

To commence ; with regard *to teething*, the condition of a child's teeth, in after years, depends a great deal on the mother. The great amount of decay met with in temporary teeth, is due to carelessness of the mother in great part. And so it is necessary to impress upon the mothers the important part these teeth have to play, and to teach them that they are not simply cut to be pulled out when decayed. Earlier than this, mothers should be taught what a child should get in the way of nutrition from her, it may be during the intra-uterine period or after birth. She should make proper provision for that nourishment by her mode of living. Teeth, as you know, are composed for the most part of Calcium Phosphate, and these elements, therefore, should be in her own nourishment in due proportion, and they will be transmitted to the child, and will help to produce strong sound teeth. On the contrary, if a mother did not have this due proportion of Phosphorus and Calcium, it is probable that the child, in after years, would have to be dosed with Lime medicines, in order that bone formation might go on. Again, mothers should be taught the absolute importance of cleanliness in the prevention of decay. The child should be taught to acquire the habit of using tooth-pick and tooth-brush, cleansing the teeth night and morning. The disturbances which occur during teething are very variable. Some children pass through the period with little or no pain, whilst others are left with lesions which remain, and have their effect on the health of the child for a long time. The temporary teeth are cut in groups, and with each group, the disturbances generally make their appearance, and much may be done to alleviate the suffering of the child.

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* Read before the Students' Society, Victoria Dental Hospital, Manchester.

When about to cut a group of teeth, the child should be kept quite warm, should not be exposed to draughts, and it should not at this period be vaccinated. Local treatment too can be adopted where the gums are congested and swollen, such as scarification with a sharp lancet, the sharper the better. Scarification should be performed where the gums are tender and much inflamed, or instead, a leech may be applied at the angle of the jaw. If the tooth, about to be cut, points under the gum, and if the tooth causes pain, then a crucial incision for molars and a straight one for centrals, will give great relief. The incision, in case of an incisor tooth should be made slightly to the anterior of the tooth, in order to avoid the danger of wounding the permanent tooth germs, which are placed at the back of the temporary teeth. If nervous symptoms appear, then the lancet must be freely used. We find a case cited in Tomes' Dental Surgery, of a child falling down insensible through no visible cause, and after the operation of lancing was performed, immediate recovery took place.

With regard to irregularity, gentlemen, it is a subject on which there is much variance among professional men, and in as much as no hard and fast lines can be drawn, and each case demands an individual way of treatment, I shall say only a few words on the subject.

About the irregularity in temporary teeth little will be said. The principal irregularity is that of number, and to this Coleman adds, in position, in size, and in form. He says molars and cuspidati are so developed that there is great difficulty in distinguishing between them and permanent teeth. He gives three distinctions. 1st, by the translucent colour. 2nd, by the termination of enamel in a ridge. 3rd, by the wear on masticating surface. With regard to irregularity in number, then it may be said that absence of any number of the series does not often occur, but such a thing is known. The irregularity is, then, generally, excess in number ; if the excess tooth is in good position in the arch and does not interfere with the bite, or irritate the tongue or lip, or cause undue crowding, then it should remain, as it will perhaps be useful in maintaining room for permanent teeth. About the irregularities of size, form, and position in temporary teeth nothing in regard to treatment need be said.

There are certain irregularities of permanent teeth whilst temporary teeth are *in situ*, they are principally in position, e.g., we may have the upper centrals cut whilst the temporary centrals are in position, the permanent teeth either protruding or biting inside the lower permanent incisors. Well, gentlemen, we have to be guided by circumstances in each case. Of course in this case the temporary incisors would have to come out, and it might, or might not, be necessary for the patient to wear a plate in order to pull in, or push out, the permanent teeth. Again, owing to want of room, a central or lateral incisor may be rotated with labial surface turned mesially or distally. For this, if the case were suitable, you might adopt immediate Torsion, or, if not suitable, you would adopt the somewhat slower method of turning by springs. It is found necessary sometimes to extract one or more teeth to give room for the treatment of irregularities. The teeth generally extracted are the six year old molars, about which more will be said when we come to the individual consideration of these teeth.

And now in consideration of filling. The temporary teeth are by no means so strong and capable of standing caries and wear and tear as the permanent teeth, having in their structure much more organic matter. These teeth have to serve their possessor for a more or less definite period, and have during the time, to perform the important duty of mastication. Their soft structure, combined with the bad condition of the mouth, generally met with at this period and due, as before said, in great part to carelessness, accounts for the great amount of decay met with. And it is owing to this fact that we sometimes, I may say often, see those cases where a proportion not small, of the temporary teeth are lost. Cases of this character present themselves frequently down stairs in the Surgery, and it is a pity to see the mouths with so few teeth in them, the early extraction of which not only impairs mastication but brings about a crowded arch and teeth predisposed to decay. I think extraction in these cases should be our last resource and not the way out of a difficulty, and it is surprising, so say many of our first men in England, how well these teeth can be treated, and brought to be of service until such event as the eruption of a permanent tooth, necessitates their removal.

We will now consider the operation of filling. The arguments for filling are:—

1st. That it is better than causing to so young a patient the shock of operation.

2nd. That it will help in the development of jaw, and in maintaining room for the permanent successor.

3rd. That it will keep up the proper nourishment of the patient by reason of masticatory function.

The material used in filling these teeth will again depend on circumstances, and on the nature of the cavity. Gold, by reason of the difficulty of insertion, will of course, be excluded in these teeth. In crown cavities where the pulp is not exposed, and where the floor of the cavity is quite hard, Sullivan's amalgam, or some other copper amalgam may be used. I think Sullivan's is the best. Should the floor of the cavity be somewhat softened and tender, but the pulp not exposed, then a layer of Fletcher's dentine mixed with a little iodoform and oil of cloves may be applied, and the cavity temporarily filled with gutta-percha, which, after some time may be removed, and, if easy, Sullivan substituted. If amalgam were put on a tooth like this, without Fletcher's dentine it would convey, by reason of its conductivity, change of temperature, and so cause irritation of pulp. Another filling material is permanent gutta-percha. This may be used in crown cavities, but I think is not so good as Sullivan, except in those cases of interstitial decay, where Mr. Bonwill's method can be carried out. This method, gentlemen, consists instead of breaking down the crowns in order to get at the decay, in simply scooping out the decay from the side of the tooth or teeth, and filling the cavities with one piece of gutta-percha. This method saves the food from getting in between teeth, and so irritating the gum. The advocates of this practice say that the operation is quite successful, the locking of two teeth together not causing any discomfort.

In those cases of pulp irritation, where there is not actual exposure, it is best, in cases of front teeth, to carefully excavate the cavity, keeping it dry by folds of napkin, and then mopping out the cavity with carbolic acid, filling with a layer of Fletcher's dentine and oil of cloves with iodoform, and finish the filling with more lasting osteo. In the case of molars the same treatment as above will suffice, or, instead of finishing with osteo, amalgam or gutta-percha may be used.

Next we come to those cases of exposure of pulp, but where the pulp is healthy otherwise than with, perhaps, a slight superficial inflammation. The majority of these cases can be treated successfully by capping, after, say, the application of an oil of cloves dressing.

A good thing to use in capping is very thin cork, which when dipped in Fletcher's Dentine mixed thin, with a little Iodoform, is easily carried and applied to the pulp, and which becomes quite rigid, so producing a good cap. The filling, of course, should be finished with osteo.

In cases of inflammation and sloughing of pulp but where the tooth pains very much, we see two ways of treatment, viz :—that treatment by antiseptics and escharotics, and so preserving the pulp, and that of devitalization, at once, of the pulp, and cleansing roots. To consider the latter first,I think it is better that $As_2 O_3$ should not be used for the devitalization of temporary pulps, for the root canals are comparatively large, and just beneath them are the advancing permanent teeth in a stage of calcification by no means perfect ; these conditions affording risks which I think it is better not to run. If, then, it is decided to kill the pulp, this may be done by application of strong carbolic acid. Then, the dead pulp must be extracted and the pulp cavity dressed, with mild antiseptics (again keeping from the use of mercuric chloride) and subsequently filling the cavity with osteo, taking care by means of a cap, to exclude the filling from root canals. If it is decided to preserve the tooth, then antiseptic dressings may be applied, such as iodoform and glycerine, weak carbolic, and for obtunding of pain, oil of cloves, and after subsidence of pain the tooth may be filled by cap and osteo, as above mentioned. With regard to the filling of root canals of temporary teeth. Some practitioners advise the filling of them with some light absorbent material, say cotton wool and iodoform. I think it is preferable to leave the root canals empty, for then no material incapable of being absorbed, will be liable to get in the way of the advancing permanent tooth. Some practitioners also recommend, in these cases, that the tooth be ground down to the gum level; for this long and somewhat tedious operation to the patient, I can see no reason, and on the other hand, it (the tooth) is in many cases, lost for purpose of mastication. Some practitioners recommend that the tooth be chipped down to saucer-shape, in order to allow of no food collecting, or, if collected, of being easily removed by the tongue. Another way of treatment is to fill, leaving a little hole in the filling for escape of matter from the roots.

In cases of periostitis, not yet approached to suppuration, some good is undoubtedly done by painting with iodine and aconite. Scarification is recommended, but it will be found often necessary to extract these teeth.

One more case I mention and then I pass to the consideration of the sixth year molar.

It will sometimes be found that the roots of temporary incisors are left standing in a quite healthy alveolus and gum, with the crowns entirely broken off, the age of patient being about 4 or 5 years.

A case of this sort, I saw treated by a fellow student, and the treatment I think was very good. He smoothed down the edges of the roots, and after cleansing them, filled up the orifices with osteo, just in order that they might be retained until the descent of the upper centrals. Moreover, the plugging of the orifice prevented food and other dèbris from entering, and subsequently decomposing, and causing alveolar abscess or periostitis, &c.

The sixth year molar must be included under the head of Children's Teeth, although it is, as its development testifies, a permanent tooth, yet the early age at which it is erupted, and the time by which it precedes eruption of other molars designate it a child's tooth. It is a common error with mothers, too, to mistake this tooth for a baby tooth. I remember, some months ago, a most persistent woman coming to this Hospital along with her child. She stated that the child had had toothache very badly, and desired me to extract, what she considered to be, one of the first teeth. After informing her that it was a second tooth and that they should not be extracted so soon, she contradicted me, saying, that she was sure it was a first tooth, for she had seen it come. After asking Mr. Birkett to corroborate my statement, which he did, and after using all sorts of arguments, I believe the woman went away disgusted with our ignorance. Putting then this error of mothers, together with the very general notion that the temporary teeth are intended to be lost by decay, it is not surprising that so many sixth year molars are lost. To enhance this, the sixth year molar is cut in a very imperfect state, as regards its development, having a tendency to deep fissures and imperfect union of enamel edges, and is, therefore, predisposed to decay. (Mr. White, M.D., D.D.S.) This tooth, then, is somewhat imperfect, and yet has, perhaps, more work to perform than any other tooth. For, in a good percentage of cases, it has to perform mastication, unsupported by any other tooth, *i.e.*, molars, for some years. The size of this tooth also renders it a very important organ, as regards its retention in the mouth, at any rate up to the 11th year.

There are also at the 11th or 12th year equally good reasons for its removal if carious. The reasons for extraction at this age, if carious, are that being the largest tooth in the head, its removal will ease any crowding, and so take away a cause which has to account for a large amount of decay. The reasons for retention are principally : 1. Its usefulness in mastication. 2. The shock of extraction. 3. Tipping.

With regard to this last reason, it must be remembered that the loss of one generally necessitates the loss of the other, so that if one be removed the antagonist will probably also have to be removed.

Up to the age of 11 years then, this tooth ought, where possible, to be retained ; and the treatment for retention will vary as its condition varies, and this I will not go into, seeing the number of these teeth which are filled and treated.

With regard to extraction of temporary teeth, I shall say nothing, this subject having been extolled upon by Mr. Headridge in his paper, "The When of Extraction." And now I must, as all good things come to an end sometimes, conclude my paper, thanking you for the kind way in which you have listened to it and hoping it will provoke useful discussion.

IRREGULARITIES OF THE TEETH.*

By Dr. C. Cutler Smith, Ilion, N.Y.

Mr. President and Gentlemen :—

In coming before you to read a paper on Irregularities of the Teeth, I feel that I am talking to gentlemen who have had far more experience than myself, but, as we are here to learn, I hope to profit by your criticism.

Regulating is a subject on which much has been written, and said, perhaps no more than on any other subject which we usually discuss ; and I find it hard to bring anything very new before you. In the beginning we must start from one point,—the teeth are irregular, and we wish to move them into a better position by some means or other. The means is where dentists begin to disagree and new ideas to originate.

We may first consider irregularities, a few of their causes, and advisability of attempting to correct. Perhaps among the most frequent causes are inherited irregularities, although perhaps these in the first case may be traced to a more direct cause in the ancestors, such as the too early extraction of deciduous teeth, thumb sucking, mouth breathing, irregularities caused by improper antagonism, and occasionally the leaving of a deciduous tooth in too long.

Of the too early extraction of teeth, I think that is an evil which is growing less as our profession advances, and children are brought to us earlier in life. Deciduous teeth are filled with cement. Parents do less of the promiscuous pulling than they used to, with the universal forcep—the string ; and so temporary teeth remain in place longer, and the arch is kept out in shape, until the permanent tooth puts in an appearance, causing the roots of the temporary teeth to absorb, and they usually come out themselves. Whereas when they are pulled earlier the alveoli contract together and must be more hard and dense to break through, and if the tooth finds a thinner place at the sides, or the other teeth are so close together that it has not room to come in the proper place, it must necessarily come outside or inside the arch. Thumb sucking and mouth breathing are certainly productive of much evil which I have not time to discuss here.

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* Read before the 5th District Dental Society, New York State.

As to irregularities caused by improper antagonism, we all know how the upper front teeth are pushed out, when the back teeth are lost; so we can see how other irregularities may be caused in a similar manner.

Perhaps it would be well to next consider the advisability of regulating. That it is not always advisable to attempt it, I think you will all admit. There are a great many things to be considered before undertaking it. I think it is always best to begin by taking an impression, then one can sit down and make a thorough study of the case at his leisure. He can see much better the effect the extraction of a tooth would have, and judge the amount of force necessary to move the teeth; and the effect it would have on the bite and can then decide if it is best to attempt it.

The age of the patient must also be taken into consideration. We can commence too early, as teeth which are out of place in youth often gradually come into place with the development of the jaw as the child grows older. There are, of course, cases which can be commenced sooner, when it is plain the teeth will not come into place, and it is evident that the regulating can be done more easily than later I have in mind a case of a young lady of thirteen years, in whom the six upper front teeth were so prominent that the lips did not cover them when the mouth was closed. I extracted the first bicuspid on each side and directed her to push on the tooth with her forefinger. She came to me some four years later for some filling; the teeth were well back, and the articulation as perfect as could be desired.

There is also the opposite extreme of too old, and here there is even more latitude than before; and although it is likely that the teeth could be removed at a very advanced age, the question is, whether they would grow firm afterward. In regard to this, some advance the argument that the teeth that are pushed out from the losing of the back teeth are usually firm, and this seldom occurs until after middle age; and so I think we can take a hint from this, and when we have fears that the person is so old that the teeth will not grow firm, it may be safely done by imitating nature and moving them very slowly. Within a few months I have completed a case for a lady over forty years old, which is very satisfactory to the patient and myself. Some of the back teeth had been lost, which changed the articulation, forcing one of the lower centrals out so as to strike the upper central and was beginning to move it, and had worn the tooth away until it was quite sensitive. I removed the lower central and drew the under teeth together very gradually by simply ligaturing with floss silk ; they are now firm, and plates have been put in to prevent further trouble. And so in age as in youth, we find the rules governing this class of operations very flexible.

After we have decided that it is possible, and the patient of a suitable age, we should always inform them that there is quite a good deal of pain to be endured, and find whether they can and will endure ; and also that they will have to wear appliances of some kind in the mouth. All of these objections must be overcome, and the patient as well as the dentist must have a large fund of patience to draw from. At this point, it might be well to say that I have found Sulphate of Quinine, applied to the part where it has been inflamed from ligatures, often proves very effective in reducing the inflammation and preventing soreness

Every one knows that it is nearly always better to take out a tooth back of the first six, and yet there are occasionally cases, especially in men, and where the desired object may be obtained much quicker and at a great deal less expense, that a lateral or cuspid may be pulled. Although it is nearly always best to avoid pulling the cuspid as the root is so large and long that it is almost sure to change the expression of the face. One case where I thought it was wise, I will cite. A young man, twenty years old, all the teeth fully erupted except the upper right central, which was just through the gum over the left central and left lateral, the lateral was close to the central. I extracted the left canine, drew the lateral back to the first bicuspid, then the central into place. And I think no one but a dentist would detect that he had ever lost a tooth.

We will now consider that we have the case ready for regulating. The proper tooth out, and all attending circumst ances favourable. We next have to consider by what means we shall accomplish the desired result ; and here we have a wide choice of agencies, rubber bands, floss silk, jack screws, and gold and piano wire springs, as well as inclined planes, wedges and other special appliances, all of which have advantages and disadvantages ; and some of which are applicable in one case, while others are better in another.

We are all undoubtedly more or less attached to our own methods, although willing to adopt others, when we can see manifest advantages, and yet appliances which are successful in one person's hand are not nearly as much so with another; so I will leave you to your own choice.

Having the teeth in place, we must nearly always use some means to keep them there until they grow firm. After a tooth is in the proper position, I retain it there with narrow gold bands or fine brass or gold wire, fastened with cement. Sometimes with a gold band cemented to a solid tooth, with an arm of firm gold, this is a fixture, many times very useful in regulating, the arm being used as a spring, and bent as often as required.

In conclusion, I would say, when I first commenced practice, regulating was in its infancy. The idea of moving teeth as far as we do now would have been considered impossible; and the regulating then done, consisted largely in extracting some tooth, and trusting the rest to nature. Now, due to the research and inventive genius of my brother dentists, we are enabled to accomplish wonders.

THE DENTAL REGISTRATION FUND.—The report of the Finance Committee, presented by Mr. Bryant to the General Medical Council, shows that the receipts of the Dental Registration Fund for the year ending December 31st, 1891, amounted to £931 19s. 2d., showing an increase of £425 16s. 6d, on those of 1890. This was mainly due to registrations under Section 37 of the Dentists' Act prior to the date on which the Bye-laws relating to that section were revoked. On the other hand the expenditure had been £582 11s. 9d., being less than the income by the sum of £349 7s. 5d. The indebtedness of the fund to the General Council only amounts now to the sum of £94 8s. 9d., and Sir W. Turner in alluding to the satisfactory state of things, pointed out that a stage had almost been reached when the income of the fund would balance the expenditure.

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EXAMINING EXAMINERS.

There is something, at first sight, incongruous in the idea that the General Medical Council should find it necessary to appoint an Inspector, who is really an examiner, to travel round to the various Medical Licensing Bodies, in order to ascertain how certain personages, so awful to the student's mind, do their work, or, in other words, whether they can pass an examination in examining. But perhaps it is in the fitness of things that so long as there are many gates of entrance it is necessary that a guard should visit the sentry at each, and determine the correctness of the *pass*-word. Even if there were a State examination there would also probably be subdivision into districts, with separate examiners who, according to the present estimate of human weaknesses, might require supervision.

The Council have adopted a report, presented by the Executive Committee, bearing upon the visitation and inspection of examinations. Dr. Duffy, of Dublin, was selected as Inspector, out of twelve candidates, and it was agreed that the reports of the Inspector and Visitors of examinations are to be sent to the Examination Committee for printing, and that a copy marked 'private' is to be circulated amongst the members of of the Council, a confidential copy being sent to the Body to which the report refers.

We shall be interested to watch whether, later on, the Council will adopt the same system for the dental examinations. Such a proceeding would lead to a levelling up of the standard of the different Boards, although we are glad to think, from what we have recently heard, that there is an improvement upon the condition of things which once existed. We have no actual knowledge as to what takes place elsewhere, but with regard to the examination for the dental diploma in England, there would appear to be a considerable amount of amateur patrolling and watching in connection with the practical and *viva voce* portions of the examination, whilst the questions set in the written papers become, more or less, common property. It is no unusual thing to find half a dozen, or more, of teachers and visitors listening closely to the questions and answers passing between the examiners and candidates, and we ourselves recently had an opportunity afforded us for following the process from beginning to end. So far as the papers are concerned there is, we believe, a system of exchange, so that each is read by two examiners who, if necessary, have a consultation. The second day's work is the most arduous as it embraces, practically, three separate examinations, the whole of the fore-noon being spent in mechanical work, the afternoon in filling, and any other kind of operative work, and then, after a short interval each candidate is treated to a display of oral cases, including irregularities, known in student phraseology as "Regs." On the third day, for the *viva voce* the candidate visits four tables at each of which sit two examiners. The whole proceedings seem thoroughly carried out; as much consideration as possible is shown to the candidates ennervating environment and due allowance made for individual peculiarities. Altogether the examination seemed very fair, and so "open" to inspection as to disarm all attempts at adverse criticism.

This being the case we were somewhat surprised last week to read a manifesto addressed to the members of the British Medical Association by the students of one of the dental schools, in which they complain of certain conditions constituting such an anomaly as calls for speedy reform. Amongst other things exception is taken to the constitution of the specialist side of the Examination Board which consists of four dental surgeons. There are six dental schools which send up candidates, but only one,(and this is not theirs) is "represented," according to this view; the other three gentlemen not being connected with any Dental School. We are not concerned to refer to the mode of election further than to say that the vacancies are advertised and the appointments made by the Council of the College, but we should seriously question the office being considered in any sense as a representative one so far as any particular school is concerned. Indeed how the six dental schools could each have a representative on a Board composed of four examiners surpasses ordinary arithmetical capabilities. The illogical position taken in this letter becomes more marked when, later on, we read of the effects which, in the signatories' opinion, are the result of having a "representative." They would apparently like to share in the wrong-doing, intensify the "anomaly," and cure the evil by repeating it. We have no idea how the candidates from this school have come out in the examinations, but, speaking seriously, we can assure them from what we know of the examination, that if they work steadily and honestly during their two years at hospital, they will find that they will be able to obtain their diplomas without requiring the assistance of a guardian angel in the shape of a "representative."

For the rest, we hope they will be satisfied with finding their names in the full glory of type, but, if they feel obliged to make a fresh appeal, let them first seek the advice of their teachers as to the utility, or otherwise, of attempting to lower the worth of their special diploma in the eyes of their medical brethren.

THE DENTAL HOSPITAL OF LONDON.—The authorities of this Institution have apparently come to the conclusion that an altogether new site must be found and a new building erected. From time to time enlargements and additions have enabled the work to be conducted with great success, but the present requirements of both patients and students can only be met by a departure from Leicester Square. It seems, for many reasons, a pity that the Hospital should be removed from its present position and associations, but as there is no more building land to be acquired at the back of the present premises, and as development laterally has reached its utmost limits, there is no alternative. The sum of money required will probably be about £40,000, of which the medical staff and friends of the hospital have already promised £3,000, and as soon as enough has been received to purchase a suitable site, the new building will be commenced. All those past students who are now successful practitioners, and have not already done so, have an excellent opportunity of testifying to their esteem for their *Alma mater*.

DEATH IN THE OPERATING CHAIR.—Further details have been published with regard to the unfortunate case mentioned in the last number of the *Journal*. It would seem that, with the idea of producing anæsthesia, 8 or 10 drops of pental were applied in a face-piece, for a short time, but the patient pushed it away. The tooth was then extracted, and Frau Brandt-Goetz fell back with a loud shriek and never recovered consciousness. The official examination showed that the brain, lungs and vessels were healthy ; there were, however, indications of fatty degeneration in the heart, and death was attributed to syncope, most probably due to the cardiac condition.

ANÆSTHESIA BY BROMIDE OF ETHYL.—J. H. Brinton has lately recorded his experience with this agent in some 50 surgical operations. He noticed the rapid action and quick recovery of sensibility, and that the stage of excitement was extremely short. There was seldom nausea or vomiting. There were, however, serious drawbacks, the chief of which was a tendency in some patients to muscular rigidity, either general or affecting special groups of muscles; several times there was complete opisthotonos, and often firm contraction of the abdominal muscles. Another peculiarity was the degree and violence of arterial hæmorrhage, accompanying operations under this anæsthetic. This was considered to be undoubtedly due to the great rise in arterial blood pressure, and in view of the facts stated, Brinton is no longer inclined to advocate the extensive use of bromide of ethyl as an anæsthetic.

A Tooth in the Tongue.—A case has recently been reported on the Continent where a girl of twelve years of age complained of a pain in the tongue. The medical man, on a closer examination noticed something hard in the substance of the organ, and a small incision allowed the escape of a foreign body in the form of a broken tooth. It seems that before the patient was six years old she fell down, injuring the tongue and fracturing an upper incisior. The wound in the tongue healed up and gave no further indication of any irritation. As it was no doubt a temporary tooth, with the root most probably much absorbed, the foreign body would not be very large.

Assumption of Titles.—At the recent meeting of the General Medical Council, the President, in his opening address, alluded, amongst other matters, to the case of a registered medical man, who had appealed against a conviction of having wrongfully assumed certain designations and titles. The case came before the Court of Queen's Bench, and the conviction was confirmed. The judges expressed very decided opinions as to the illegality of a qualified person adopting additional titles which he did not possess, and it is to be hoped that this decision by the High Court of Justice may be made to apply still more forcibly in those cases where persons who hold no qualification whatever, and who are unregistered, yet venture to assume professional titles, and other designations, likely to deceive the public.

ELECTRIC TRANSILLUMINATION OF CAVITIES.—Our readers will remember that, amongst others, Mr. Ashley Barrett and Dr. Hunter Mackenzie have recently pointed out that it is not always possible to rely upon the difference in the appearance of the two antra, when using the electric light for diagnosis. In some cases, however, such a means may be of service, and a lamp upon a new pattern, made by Edison and Swan, of five-candle power has lately been specially devised for the examination of the cavities of the face. There is a glass covering which encloses the lamp and protects the mouth from undue heat, or risk from accident to the lamp. It is mounted in a vulcanite tray which receives the teeth, the lips being closed over the front, and there is, moreover, free communication with the external air by the tubes which pass through the vulcanite to carry the wires. It seems that Julius Bruck, a dentist of Breslau is credited with being the first to employ the platinum loop in medicine, and in 1867 he showed a stomatoscope which obtained some notoriety.

"WOUNDING BY IMPRUDENCE."—Until the new law regulating medical and dental practice in France comes into effect, there will still be the same uncertainty with regard to the administration of anæsthetics, except when, as from time to time happens, the patient unfortunately dies. In a recent case it was proved that at a "Dental Louvre" in Paris, the number of cocaine injections averaged 500 a month. Neither the principal nor his assistant possessed a medical qualification entitling them to use anæsthetics, so that when a lady died after the injection of cocaine, a judicial enquiry was held with the result that both were fined 15 francs for the illegal practice of medicine, and condemned in costs, whilst the assistant, who actually performed the operation, had to pay in addition 100 francs for "wounding by imprudence.".

DEATH FROM IMPACTION OF ARTIFICIAL TEETH.—Another of these unfortunate cases has recently been investigated by a coroner, and is of interest because the accident did not occur through the patient retaining the plate at night time, as too frequently happens. In this instance a young police constable, upon the advice of the divisional surgeon, had certain teeth extracted and replaced by artificial ones. He had been running in response to a police whistle, to assist in taking a prisoner to Bow Street, but after going a few yards he fell to the ground ; his collar was loosened, and he was conveyed on an ambulance to King's College Hospital where the house physician found death had taken place. A subsequent examination showed that a tooth-plate was impacted at the larynx, and that suffocation was the cause of death. We can scarcely expect that "first aid," which is now so much in vogue, should include the operation of laryngotomy under such circumstances, but it is possible that if the cause had been promptly discovered, and an opening made in the crico-thyroid membrane to relieve the immediately urgent symptoms, the plate might have been afterwards recovered, and the constable might have tided over an attack of bronchitis. We notice that the medical witness considered the teeth were of inferior make, and became loosened through the deceased running, an inspiration drawing them down his throat.

Review.

Notes on Dental Practice, by Henry C. Quinby, L.D.S.I. London ; J. & A. Churchill, Liverpool ; Gilbert G. Walmsley, 1892.

These notes are interesting as representing the aspect of dental surgery from an old practitioner's point of view. His experiences on many matters are here recorded, and if expressed in too self-assertive a manner, are perhaps not less interesting on that account. There are some trenchant remarks with regard to teachers and pupils, and the reader will agree with the description of the sad results of ignorance on the part of parents.

The author has not attempted to "wade in the deep waters of physiological and pathological research," but he has, nevertheless, found it necessary to take a little dip, however much averse to it, when dealing with points in surgical practice. Still, this warning prepares us for the discovery on p. 20 that the author prefers to consider germs a result of caries and putrescence, rather than a primary cause.

On another page the opinion is expressed that if the cartilaginous substance left at the bottom of a cavity be protected, it will often become recalcified, dense healthy dentine, but it should be first treated with carbolic acid. Indeed, this remedy is much extolled, though whether in this particular instance it has any effect in stimulating the process of re-calcification "may be a question." It will be seen that the author has easily settled for himself a somewhat difficult point which has recently been discussed, and in which two of our researchers in in bacteriology took opposite views.

Amongst many other points of interest are the criticisms passed upon such modern innovations as the rubber-dam, saliva ejector, mallet, and wedges ; these appliances are not for the benefit of the patient.

The appendix is by another author and deals with anæsthetics. This, too, is interesting from the fact that it describes "an application of Chloroform to dental surgery not generally adopted or understood." It is described as the open method of giving chloroform in order to "keep up a transient minor anæsthesia," and the writer does not regard the condition mentioned as being likely to subject the patient to shock, although he stipulates that if all reflexes are to be abolished and a total anæsthesia brought about, then chloroform is not advisable in dental surgery. The respiration is regarded as the main index, although the pulse and other matters may be observed with advantage. "Slow and shallow respiration may occur early; the inexperienced may be alarmed. It is merely that the patient has gone to sleep and is not really under the influence of the chloroform. It is wise to awaken the patient, and, if in doubt, to suspend the chloroform, and if need be, go on with ether."

Abstracts of British & Foreign Journals.

ANÆSTHETICS A NECESSARY PART OF THE CURRICULUM.

By J. F. W. Silk, M.D.

The author records a plea for a systematic teaching in the subject of Anæsthetics, and discusses the matter under the following heads:—A. The nature and character of the instruction in anæsthetics at present offered to the student. B. Some reasons for thinking that this instruction should be improved upon. C. A brief indication of the direction in which it is both possible and desirable to make this improvement.

A. Although, no doubt, some allusion to anæsthetics is made in lectures on surgery at the medical schools in the United Kingdom, and surgeons occasionally direct the attention of students clinically to the subject, yet, with these exceptions it does not appear, judging from the school prospectuses, that any special instruction is afforded in Scotland, Ireland, or the provinces. Even where anæsthetists are attached to the hospitals, it would seem as if their duties were functional rather than academic. In the metropolitan schools things are a little better; in London there are twelve schools which are responsible for the education of between 40 and 50 per cent. of all the students registered at the Medical Council. To eleven out of these twelve schools, special anæsthetists are attached, and in nine of these, it is definitely stated in the prospectus that instruction in anæsthetics is given. The actual amount of instruction afforded, varies considerably, and it is almost as impossible, as it would be invidious, to estimate the exact value of the instruction given in the several instances. In some, lectures and demonstrations are given, in others the teaching appears to be limited to instruction simply, and this may mean almost anything. The author thinks that, under the most favourable view, only 35 per cent. of all the London students are instructed in any special manner, and that many students must obtain almost their first experience in administering anæsthetics after they are qualified, and after they have gone beyond the reach of supervision and instruction.

B. The art of surgery has improved precisely in proportion to the certainty with which we can foretell results, and the possibility, however remote, of the death or subsequent illness of a patient, as the direct result of the anæsthetic, introduces an element of doubt which we ought to attempt to remove. If anæsthetics were taught more systematically, not only would the standard of average skill in administering them be raised, but we should soon get to know more about the subject.

Now-a-days a surgical operation is a much more complicated and deliberate proceeding than formerly, and even if it be denied that the induction of anæsthesia is absolutely essential for all operations, it may, on the other hand, assuredly be asserted that without it many of the tedious and prolonged operations of modern surgery would be impossible. No details are now considered too minute or trivial to receive the most anxious consideration and thought from the operating surgeon, who usually takes care too that those who assist him shall be well trained in his methods, and, therefore, the administrations of anæsthetics, which is itself one of the essential details of every operation, should be taught with as much care as is nearly every other detail. The author thinks that, considering the enormous number of administrations which now take place, the relative amount of instruction afforded will bear no comparison either as to quantity or quality with that obtaining in any other branch of our art. The importance of the subject is another reason for improvement in teaching and the student's attention should be directed to the responsibility he assumes when he undertakes to induce anæsthesia. It cannot be too frequently or too strongly insisted upon that in every case the administration of the anæsthetic requires the sole and undivided attention of one individual. As has happened in all other branches of medical science, increased knowledge has led to the introduction of great improvements in the methods employed, which of necessity tend to become more and more complicated and delicate. Cones, face-pieces, inhalers, &c., of varying degrees of complexity have been introduced, all of which require a certain amount of skill in their manipulation, and with which it is highly desirable that the student should become familiar. Our knowledge, too, of the alterations in the physiological state induced by the anæsthetic has undoubtedly increased, and would increase still further under the stimulus of systematic teaching. Apart, however, from mere manipulation, there are several points which call for careful study and anxious attention, and it is to the consideration of these points that the author believes that the greatest good is likely to result, rather than in futile efforts to select a universal anæsthetic whether by physiological, clinical, or statistical observations. For instance the preparation of the patient ; the best time for operating ; the after treatment of the effects of the anæsthetic, such as sickness, &c., are all points upon which the anæsthetist will occasionally be asked to express an opinion. More frequently, however, he will be called upon to exercise his judgment in the choice of the particular anæsthetic to be used, having due regard to the idiosyncrasy of the patient, the sex and age, the previous history and present physical condition, and the nature and probable duration of the operation; the anæsthetist will also be called upon to select the particular method or methods to be employed, and to change, if need be, during the course of the anæsthetisation the particular drug with which narcosis was originally induced : to watch for and promptly treat any emergencies that may arise and to warn the operating surgeon if the condition of the patient becomes such as to render further proceedings unadvisable. Upon all these points there is something to be said, something to be taught, and further information would rapidly accrue if the teaching, and with it of necessity the study of the subject, were undertaken in a more systematic manner. Perhaps the most important of all the reasons consists in the difficulties and dangers connected with the process of anæsthetisation and systematic teaching would afford help when it becomes necessary to adopt means for resuscitation. The author gives a table from the reports of the Registrar General for the ten years 1881—1890 which shows that the dangers do not simply exist in the imaginations of anæsthetists. From investigations he has made, he comes to the conclusion that the greatest number of deaths occur in the practice of young administrators, that is at just that period of their professional career when teaching is most likely to be of service, and to stand in the place of that experience which they gain subsequently.

C. An outline of the plan suggested is this:—1st. Candidates for the various degrees and diplomas should be required to produce evidence of proper instruction. 2nd. The system of teaching at the hospitals should be the same as that adopted in other cases, that is, that after attending the classes, the student should be appointed "clerk to the anæsthetist," when under the direct supervision and guidance of his teacher he should administer to the necessary number of cases and should keep whatever notes and records may be thought advisable. Finally, in the large hospitals especially, it would be of advantage to appoint resident anæsthetists to take charge of the administrations in the absence of the honorary officer.

Lancet.

SURFACE PROTECTION FOR PLASTIC FILLINGS.

By G. V. I. Brown, D.D.S.

That there is need of some material other than gold, is very generally admitted, for while it stands pre-eminently at the head of the list as of greater general utility in the mouth than any other filling, there is nevertheless a limit to its usefulness which falls short of the dentist's daily requirements.

It is unsightly in the anterior teeth, it is incapable of preserving successfully a large class of teeth which are in too frail a condition for its proper insertion, and patients unstrung as they frequently are by the depleting influence of modern civilized life, and other causes which tend to deteriorate the healthful condition of the nervous system, but which do not necessarily give such outward evidence as to be considered serious at the time, are often quite unfit to stand the strain of long sitting and painful operations in the mouth, which do undoubtedly overtax the nervous force under such circumstances, and indirectly hasten in many instances more serious after trouble. After all, life is too short for needless suffering if by other methods it may be avoided, and at least as good results obtained.

Cement alone will not bear the wearing effect of mastication, and is too treacherous in its wasting away at the cervical border.

Amalgam is not generally admissable in all parts of the mouth by reason of its objectionable colour, and is subject to grave suspicion on account of its tendency to shrink.

Gutta-percha so trustworthy as a preservative against destructive influences upon the tooth structure, if unaided by other covering is of very limited general practical usefulness because it wears out too readily in exposed positions.

The author does not bring forward these forms of inlays, or surface protectors as substitutes in any way for either gold fillings, gold crowns, or even good amalgam fillings in their rightful places, but only as a suggestion for use in cases when these materials would not fulfil their highest possibilities as under more favourable conditions ; a something which may be utilized not to supplant the gold crown, but to occupy a place between, where the best use of fillings end, and the present common necessity for crowns begins, in other words to reduce to the minimum the necessity for such treatment.

While he derives great benefit in his practice from the use of various forms of tooth crowns especially as attachments for so-called bridge work it is his constant endeavour not to place a band of any kind whatever around the neck of a tooth to offer, as it must, a premium for the advancement of irritating influences in that region, that are so inimical to the healthful condition of the parts immediately surrounding unless such a proceeding is warranted by reason of absolute requirement in order to give usefulness that will prove of sufficient benefit to overcome what seems to be a deplorable necessity. He uses as a stepping stone to something better, substitutes suitable at present to only a limited number of cases, but capable of illimitable enlargement as greater perfection is acquired, and worthy of the earnest consideration which only can bring the desired result, and having in view the protection of gutta-percha and cement with hard smooth gold, and porcelain, upon proximal surfaces, the preservation of the proximal spaces so important to the cleanliness and the healthfulness of teeth and gums, and with all having next the tooth substance the readily adaptable plastic material the virtues of which are too well known to need further reference.

He frequently has in daily practice incisors from which some portion of the cutting edge has been lost by reason of an accidental blow, caries, erosion or abrasion or perhaps it may be necessary to lengthen one or more such teeth to make proper occlusion in lengthening the bite of a whole mouth.

In such cases a porcelain tip made from a plate tooth, properly selected as to colour, ground to fit the edge of the natural tooth in such manner as to give the proper outward appearance, a platinum pin fitted to extend up into the roots and attached to the porcelain tips, the palatal surfaces filled in to proper contour with backing and solder or porcelain body baked upon them, the tooth cavities filled with gutta-percha, and the tips heated and pressed home, have given the author satisfaction, and he regards it as a conservative operation to be preferred to cutting off the whole crown down to the roots and crowning by any of the methods usually employed.

When we undertake to consider cavities upon the labial surfaces of incisor and cuspid teeth extending under the free margin of the gums, he thinks that however personal opinions might differ as to the degree of success which each particular operator might claim to have experienced in the durability of his gold fillings in these positions, nearly all will readily acknowledge that gutta-percha could be inserted with much less pain to the patient,and much less strain upon the operator, that there would be much less danger of a recurrence of decay around the border of the filling by its use than with gold, and when we remove the objection of its rapid wearing out with the rubbing of the toothbrush and other causes, together with its tendency to assume a discoloured appearance by covering with a hard, indestructible, natural appearing porcelain surface, either by grinding, or baking porcelain, to fit, and having sufficiently deep undercuts in both porcelain and cavity wall to make it secure with gutta-percha, it seems that we have accomplished something valuable, something at least worth following up and improving.

Small proximal fillings would of course call for the sort of care only under such circumstances as might in occasional instances for a time at least render the use of gold unavoidable. For example conservative operators favour the use of cement fillings under certain conditions with the intention of keeping watch upon them either with the idea of adding more material as the surface wears down, or replacing with gold later on, when their condition has improved. It has always been his belief that this is the proper thing to do when the general health of the patient would probably be better at a later period, as after severe illness, when the vital forces have not had time to return to a normally vigorous condition, with pregnant women or nursing mothers, or where some specific or other diseased condition renders it necessary and certain that the patient will for a considerable period be obliged to take powerful remedies of known deleterious local effect upon the teeth when taken into the mouth, even though care be exercised in its administration. Often the extreme sensitiveness of the dentine may resist ordinary methods to overcome it, and be so acute that sufficient excavation for the proper insertion of a gold filling would be unendurable.

He agrees with the objection usually advanced that a perfect gold filling looks better in a tooth than a porcelain one many times, because of the difficulty of matching the colour, and also the line of junction usually visible between the porcelain and enamel of the tooth when the cement shows through, and this is one of the things to study and overcome so far as possible, but to fairly consider the matter one must remember that it is not usually the unsightliness of any particular filling in the mouth that is so objectionable in appearance itself, but it is the change in the expression of the mouth given by the lights and shades noticeable in speaking and laughing, and quite as often by small proximal fillings as large ones, that have much more to do with the general expression of the whole face, than one unfamiliar with thought in the direction would probably readily admit.

We should bear in mind that our operations upon the anterior teeth govern largely for good or ill the whole facial expression, and that we must look not alone within the limit of the circle of the orbicularis oris, but with broader view study the effect upon the whole region of the face.

Foreigners whose ignorance upon matters pertaining to dentistry we deplore, whose eyes have not become trained to the circle, and semicircle of black and shining metal upon the white tooth surfaces, speak with surprise and derision of the unsightly and vulgar display of gold in the mouths of Americans, whose wealth and standing entitles the belief that they represent the best effort of our most skilful operators.

To sum up the whole matter, his experience leads him to believe that these operations are as yet unsuited to those operators whose patients have no certain expectation at the time of an operation that they will ever patronize him again, and is necessarily a failure in the hands of oily gentlemen whose broadcast laudatory circulars treat upon the value of the "ceramic art," known to but few, etc., but is only safe and valuable in the hands of conservative practitioners whose patients have culture, intelligence and the degree of training which makes them appreciate its advantage, and also makes the periodical visits to the dentist a matter of religious duty.

The Dental Review.

LONGET UPON MASTICATION.

By F. A. L.

The following are some extracts from the chapter dealing with mastication in Prof. Longet's great work upon physiology, which is too much overlooked by the present generation of students. When the foods taken by the animal are solid and resistant they are first submitted, in the mouth, to a mechanical action which divides and breaks them up in order to make them more easy of attack by the digestive fluids. Nevertheless, this preparatory operation, which is called mastication, is not performed by the generality of animals; in fact, if those which are bereft of teeth immediately swallow down the nutriment they seize, there are many which, even although provided with such instruments, use them not to masticate but only to kill their prey, to hold it or merely to crush it. In order that there may be true mastication it is necessary that the movements of the lower jaw should be associated with those of the tongue, the lips and the cheeks, that by various movements the solid food may be returned between the teeth of both jaws, which divide and grind or triturate it at the same time that the saliva softens and turns it into a sort of paste. This kind of mastication which occurs in man is found in certain mammals, especially in those living upon vegetable foods the covering of which, sometimes very hard, must be broken in order to expose the really nutritious matter. Mastication is, on the other hand, very incomplete and limited in carnivorous quadrupeds which after having seized and lacerated their prey, hardly masticate it before swallowing it. In all vertebrates the jaws are two in number and placed one above the other. The upper jaw is fixed to the cranial bones in the case of mammals and the lower is alone moveable. It has the form of a more or less curved arch, its upper border receives the teeth, its posterior portion or ascending projection becomes curved from below upwards, and ends in two apophyses of which the anterior, or coronoid, gives insertion to the temporal muscle whilst the posterior is articular; it is the condyle of the lower jaw. The greater or less extent of the dimensions of the ascending portion of this jaw and the more or less open angle which it forms with the body of the bone are the points which have a direct bearing upon the mechanism of mastication. It is amongst Ruminants and the Solipeds that this portion has the greatest length; it is also very long in Man and the quadrumana; shorter in the flesh-eaters so that the temporo-maxillary articulation is on the same level as the teeth. Thus, the more mobility the lower jaw has to grind and triturate foods, in short the more perfect mastication is, the more also is the ascending ramus developed in length; on the contrary in the animals which only tear their prey, the condyle sinks to the level of the dental arch. Vugès attributes a great deal of importance to this anatomical characteristic which he considers as one of the most reliable signs by which to distinguish between the herbivorous and carnivorous animals. He remarks that this arrangement has more value than the development of the canines and the projection of cranial crests. In fact, certain monkeys which closely approach, in this last respect, the most ferocious flesh-eaters, are always distinguished by the ascending process of the lower jaw.

The coronoid apophysis in its size and in its relationships with the condyle and the last molar, shows some variations which must be alluded to. In the ruminants and the solipeds it is nearer the temporo-maxillary articulation than to the last molar, so that it has an arrangement unfavourable for powerful mastication. The lower jaw forms, in fact, a lever of the third order, in which the distance from the condyle to the top of the coronoid process is the arm of the power, whilst that of the resistance is represented by the space which separates the same condyle from the last molar. Animals in which this occur are, then, less well provided for strength than for a variety of movements in mastication. In men and the quadrumana the ascending process is more developed, and the coronoid process, in approaching the molar teeth thus gives more advantage to the temporal muscle. The carnivores, in which the whole masticating apparatus appears arranged for strength, have the coronoid process very prominent in order to provide sufficient insertion for the enormously developed temporal muscle. However, from the point of view with which we are concerned, that is, the length of the lever-arm upon which this muscle acts, these animals are unfavourably provided for; since the coronoid process is in them generally very near to the condyloid articulation. There is, in our opinion, only one explanation possible for this arrangement, and that is the necessity for a wide separation of the jaws in order to seize the prey easily. If the coronoid process was placed more in front, the temporal muscle would have to be formed of very long and less numerous fibres, and, in consequence, endowed with a more feeble action. Besides, the shortness of the lever upon which this muscle acts, allows it to give that celerity to the closing of the jaws which is necessary for animals using their teeth as a principal means of holding, to stop their prey in flight.

The animals in which the power of bringing the jaws into relationship is most favourably arranged, are the kangaroos. In them the ascending process is generally of considerable size, which increases the distance between the coronoid apophysis and the condyloid articulation, and in some other cases such as the beaver, the porcupine, etc. the top of this process is prolonged in front in such a way as to overlap the level of the last molar. From this it results that when foods to be ground are placed between these teeth the lever which the lower jaw represents is found to be of the second order. In ordinary circumstances, that is to say, when cutting branches or roots the rodents have in their incisors a superior power to all other animals.

The angle of the lower jaw generally follows, more or less the proportions of the ascending ramus,—nearly a right angle in man and in all animals in which the ascending ramus shows a great development; it becomes very open in the carnivores, and disappears entirely in some of the cetaceans.

L'Art Dentaire.

ON THE NATURE OF SOLUTION.

By J. Alfred Wanklyn.

It is now generally recognized that one of the great problems presented to chemists and physicists is to find what really takes place when solids dissolve in liquids and yield solutions, and a noble endeavour has been made to remodel the chemistry of the solution on the general plan of the chemistry of the gas. Work of a very simple and very humble character—upon which I have been more or less engaged for many years, and in the execution of which I have been latterly assisted by my colleagues, Cooper and Johnstone—leads up to a wide and far-reaching generalisation which is now sufficiently established to be brought into the light and submitted to the judgment of that portion of the public which interests itself in questions of this description.

Among the general properties of gases there is one very fundamental property which (so far as I know) has totally escaped explicit recognition, by reason of its extreme familiarity. The principle may be formularised thus—that heterogeneity does not influence the volume of a sample of gas Another mode of expression is this—that a mixture of different kinds of gas (provided they exercise no chemical action upon one another) has the same volume as the sum of the volumes of the different gases which compose the mixture. The principle is not manifest *a priori* but is the expression of wide experience, and is most fundamental. True it most certainly must be. It is postulated by implication in all our reasonings connected with the eudiometric analysis of gases.

In a series of papers published in the *Chemical News*, and in a paper in the November number of the *Philosophical Magazine* my colleagues and myself have recorded a mass of experimental observations, which establish the important fact that a parallel principle holds good for liquids. And we say that the heterogeneity does not influence the volume of a liquid, or that a mixture of different kinds of liquid (provided they exert no chemical action upon one another) has the same volume as the sum of the volumes of the liquids which compose the mixture.

In bringing forward this general principle as applied to liquids, I know that I shall have to deal with deeply-rooted predjudices arising from several causes—viz, that most of the commonest and most familiar instances are cases where chemical action comes in and masks the regularities. The mixture of alcohol and water, which was one of the earliest examples submitted to careful investigation, showed the greatest irregularity, and has most profoundly influenced the whole course of speculation on the nature of solution. But there is chemical action between absolute alcohol and water — heat is generated when they are mixed together, and fractional distillation is utterly powerless to separate the last 8 per cent. of water from the alcohol. The case of common salt and water also exhibits a notable degree of contraction when solution takes place.

In the November number of the *Philsophical Magazine*, there is a study of the case of cane-sugar and water, showing that the volume of the solution of sugar is exactly equal to the volumes of the sugar, and of the water which compose it. Solutions of sugar therefore, follow the law which we have enunciated, and the account we give of the formation of a solution of sugar is this—that the solid sugar becomes liquid with no, or only the most trifling alteration of volume, and that the liquid sugar then mixes with the water without contraction and without expansion.

The case of common salt, and the numerous other salts upon which we have experimented, is explained by the formation of true chemical compounds between the salts and the water—

hence the contraction, whilst the solution consists in the mixing of these hydrates with the water without further alteration of volume. It is established that one volume of a moderately strong saline solution yields exactly two volumes of weaker solution when it is mixed with an equal volume of water.

The Chemist and Druggist.

TWO CASES OF PERIOSTITIS OF THE UPPER JAW IN CLOSE RELATIONSHIP TO INFLUENZA

By Dr. H. Moser, Hamburg.

The more unusual complications, if closely related with influenza, appear quite as worthy of record and of quite as much interest as the mass of symptoms which accompanied the epidemic, and which would tend to show that it was more of a general infectious disease of the whole body. The author gives details of two cases of periostitis of the upper jaw, where this complication appeared on the fourth and fifth days after the first symptoms of the influenza. In the first, that of a lady, on the fifth day, after a sudden attack of shivering, the patient complained of pain in all the teeth of the upper jaw; the alveolar portion appeared considerably swollen, and painful to the slightest touch. The mucous membrane of the hard palate was also considerably swollen, but not very red, and just behind the front teeth a rounded swelling appeared and increased in size till the following day, when it reached the size of half a hazel nut; fluctuation could now be easily detected in it; pressure on the nasal process also gave rise to considerable pain especially on the right side, whereas no pain was complained of in the nasal bone. In three days the whole of the right half of the face over the upper maxilla was much swollen, the left only slightly so, the swelling on the hard palate had increased and there was fluctuation in the semi-globular tumour. An incision gave issue to a very large quantity of thick sweet pus, and the flow was increased by pressure on the face from the root of the nose towards the teeth : also by pressure on the palate behind the tumour. On the following day, the bone was felt on probing the wound. The swelling of the face went down rapidly after the abscess was opened but pus was discharged for another fortnight. Although the patient had several decayed teeth, mostly on the right side of the upper jaw, they were not painful during the whole of the affection, and no pus came from between the alveolus and the teeth. In the second case, the patient, a merchant aged 25, had the usual symptoms of influenza on Dec. 23rd. On the 26th he complained of pain in the teeth of the upper jaw on the right side although there was no defect visible. The pain was felt as far forwards as the middle line especially in the hard palate, and spread on the 27th in exactly a similar way to the first case, over the whole of the right nasal process. The whole of the face was very much swollen and the slightest pressure over the palate and nasal process caused intense pain. The right mastoid process became painful, the skin covering it commenced to swell and this extended in an upward direction. There was no pain in the ear itself, and the hearing was not affected. During the night of the 28th, the pain in the upper jaw, and especially in the mastoid process, was of so severe and thumping a character and accompanied by so much fever that the patient could get no sleep. Later on a large quantity of thick creamy pus suddenly burst from the outer ear, and the swelling of the skin and the beating in the mastoid process rapidly disappeared. Pressure on the back of the ear caused an immediate increase in the flow. After careful syringing, the membrana tympani, was found to be intact, and there was no disturbance in the hearing. In both these cases, therefore, the patients were seized in a most sudden manner without any apparent cause, with slight but increasing pain in the teeth, which finally extended to the whole of the upper jaw, and in each there was periostitis and suppuration. So many complications and sequelæ of influenza have been noticed latterly, that it seems most probable that these two cases, which were in close connection and relationship with influenza, are really caused by the influenza poison.

Ohio Journal of Dental Science.

SALIVARY CALCULUS.

By M. Le Prof. Le Dentu.

Salivary calculi are not often met with. They were, however, already known to Ambroise Paré, but it was not until 1737 that Scherer localized the affection in the submaxillary gland. His opinion, however, met with plenty of contradiction, and it was only in 1875 that Closmadenc showed that Scherer's idea was well founded.

The pathogeny of salivary calculus is not even yet thoroughly settled. Many authors think they are formed round a nucleus consisting of some foreign body, food particles or a fragment of tartar, as Richet thought. Inflammation of the mucous membrane round the orifice of the canal is the true cause of the formation of calculus, either by interfering with the flow of the saliva, or by increasing the proportion of salt which this fluid contains. The cause of the irritation of mucous membrane may be the use of tobacco, and that would explain the fact that the affection is of more frequent occurrence in men than in women. It usually occurs in adults, although it has been seen in children, and even in the newborn.

Calculi can occur in the small glands of the soft palate or of the lips, in the sublingual, or the parotid, and especially in the submaxillary; this last is ten times more frequently the seat than the parotid.

The number of calculi may vary. Sometimes there is only one, in other cases many may be found, placed end to end and showing facets where they were in contact. In Wharton's duct they are elongated, or, more often, irregular; those which occupy the acini are rounded. The calculus often presents a kind of gutter which allows the saliva to pass; in this case it is easily tolerated, and can attain a considerable size. The presence of the calculus excites various changes on the part of the gland. It produces a kind of irregularity with alteration in the epithelium; the irritation may affect the different lobes unequally, and one may think that the largest part contains the calculus, whilst there may be nothing but the effects of inflammation.

The commencement of the affection is often unnoticed, and insidious, and the patient frequently only discovers by chance that there is something unusual in the side of the floor of the mouth.

In other cases there is a little pain during a meal which sets up a considerable flow of saliva.

In certain cases it produces an acute inflammation which is very painful, and may appear and disappear very quickly. This suddenness in the onset and vanishing of symptoms may be due to a small calculus which gets displaced, and more or less obliterates the duct. Inflammation may sometimes result in an abscess, or there may be a gradual ulceration which finally allows the calculus to escape. One of the authors patients was thus enabled to get rid of a calculus shortly before the time fixed for operation. The appearance of a calculus has now and then been mistaken for the eruption of a tooth.

In serious cases inflammation has resulted in an abscess in the neck.

L'Art Dentaire.

THE PATHOLOGICAL ANATOMY OF TIC DOULOUREUX.

By Dr. C. L. Dana.

The author admits that inveterate trigeminal neuralgias are usually caused by local disease, bony tumours, aneurysms, and syphilitic exudations; he thinks, however, that the ordinary cases of tic douloureux occurring after middle life, and affecting chiefly the second branch of the trigeminus, are not due to such causes, and suggests that frequently they are due to an obliterating arteritis of the nutrient vessels of the nerve. 1.—The disease begins at that time of life when degenerative change in the arteries begins. 2.—That it affects chiefly and primarily one of the terminal branches of the internal maxillary; if it extends it involves the inferior dental. It rarely affects the supra-orbital which is supplied by a branch of the internal carotid. 3.—He examined four superior maxillary nerves removed from typical cases; there were no noteworthy changes in the nerves but in three of them there was striking evidence of arterial disease. In the fourth specimen no blood-vessel was present. 4.—Remedies such as aconite and iodide of potassium which produce such excellent results, all lower the blood tension. 6.—Removal of the peripheral nerves sometimes cures the disease entirely, hence the disease is often peripheral and due to some peripheral irritation. 6.—Certain authors have recently shown that a much closer and more extensive relationship exists between the nerve trunks and the blood-vessels than has hitherto been known, and had suggested that disturbances in blood vesssls might be a serious factor in causing neuralgia.

The Medical Annual 1892.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual monthly meeting of this Society was held on Friday, May 6th, 1892, at 8 o'clock. W. Robinson Humby, Esq., President, in the chair.

The minutes of the previous meeting having been read by the Hon. Sec. and confirmed, the President gave the usual form of welcome to visitors.

The President then invited gentlemen present to bring forward any casual communications that might prove interesting to the Society.

Mr. TIMMS brought forward a case where, in the extraction room, when removing the 2nd upper molar the wisdom came away with it.

The PRESIDENT said it was a very interesting specimen, that cases of gemination of 2nd and 3rd molars were very rare; he also mentioned similar cases, diagrams of which were given in Tomes' Dental Surgery.

Mr. CUTTS said that a patient, a lady past middle life, came to see him complaining of having suffered from profuse salivation, and from the symptoms she had evidently been ptyalized; on examination he found an upper molar standing alone with a loose amalgam plug *in situ*; the patient was wearing a gold plate and this was coated with mercury at the point nearest the loose plug. He (Mr. Cutts), accounted for this, by supposing that some free mercury had been squeezed into the pulp chamber (the tooth was dead) and had escaped when the filling became loose; he was at a loss to account for the marked symptoms of mercurial salivation as he understood that free mercury was not absorbed by the system. He added that the patient had previously been salivated, and that the smallest dose was sufficient to bring about the same symptoms; she had not taken medicine of any kind for some time.

On being questioned, Mr. Cutts said the filling had been in nearly seven years, and that when she came to him, the symptoms had only occurred a few days previously.

Mr. Rushton said he considered the amalgam filling had nothing to do with the symptoms and that the stain on the plate was probably due to some sort of powder she used for cleaning her plate (evidently containing mercury). The President endorsed Mr. Rushton's opinion.

Mr. Barrett showed a model representing the upper teeth of a young girl, age 15, with two supernumary incisor teeth.

Mr. Humby (the President) said : Mr. Bland Sutton gives as instances of reversion or atavism, the extra incisors which are seen frequently associated with hare-lips and congenital cleft palate ; he (Mr. Humby) had just seen such a case, and there the hare-lip was accompanied with an unbroken alveolar ridge, the extra incisors, and divided uvula.

There being no more casual communications, the President called upon Mr. Fisk to read his paper on "Pyorrhœa Alveolaris."

The President, Mr. Humby, said he objected to the term necrosis applied to the alveolar loss; that the bone disappears is evident, but by what agency is not so clear ; the loss may be caused by absorption. Regarding treatment, antiseptics have been used and successfully. He thought it impossible to remove the true tartar of pyorrhœa alveolaris. He considered that when we knew fully the cause of the disease, we should find a number of diseases in connection with it, and that the tartar finds its way into the hollow made by the disease between the tooth and the soft tissues, and that it was, therefore, altogether a secondary condition. He knew of a case where the disease had been held in check for seventeen years, where the gums were, when he saw them last, hard, and the teeth firm, the patient had been ordered to use the tincture of Aconite and Iodine in equal parts, the application to be made with a brush. He had also seen a case where the patient used table salt as a dentifrice after meals, this was her own idea, and the teeth were improving. The use of Iodine tincture had been his treatment, applied with a brush at night.

Mr. Rushton said they all must be obliged to Mr. Fisk, but after all, they knew little about the disease. He did not agree with Mr. Humby as regards absorption of the alveolus on the labial surface, but from his slight experience, he found that the alveolus absorbed more on the lingual than on the labial surface. He advised tannin as an antiseptic. As regards Mr. Fisk using Aromatic Sulphuric Acid, he considered there were other astringents far better ; he did not agree with Mr. Humby about necrosis, he contended it was true necrosis of the alveolus, although perhaps in a very limited microscopical degree.

Mr. **Prager** said he had treated several cases at the Hospital, first washing out the mouth with Condy's fluid, and then packing the pouches caused by the absorption with tannic acid and glycerine.

Mr. **Cutts** said that in one or two cases he had treated, the method he had adopted, was to remove as much tartar as possible, scarify the gums and pack in the pockets a crystal or two of Sulphate of Copper ; he saw the patients twice a week as long as possible, say for a month, and then directed the patient to use an astringent wash and apply it between the necks of the teeth and gums. As regards the term 'necrosis' of bone, perhaps caries was a better term.

Mr. C. **Bascombe** asked Mr. Fisk whether from his experience he had found this disease occurred in perfectly healthy people, or rather in those inclined to be strumous or syphilitic?

Mr. Fisk in reply, said, that he thought the term necrosis, was a proper one to apply to the loss of the Alveolus. Tincture of Aconite and Iodine, permagnate of Potash, as well as other drugs, were no doubt valuable adjuncts in the treatment. The application of Sulphate of copper, suggested by Mr. Cutts, had in many cases a beneficial effect. In reply to Mr. C. Bascombe, he had seen individuals in apparently perfect health suffering from the disease. He would have liked the discussion to have turned on the question whether Pyorrhœa Alveolaris was a germ disease or not, and the advisability of using Bichloride of Mercury. He had had an opportunity of seeing the case treated by Mr. Roughton, and certainly after treatment, there was an entire absence of pus ; in this case, the patient told him that she devoted two hours a day, to the application of the remedy. He would like to have heard from the members of the Society, an opinion of the diagnostic value of $H_2 O_2$ in determining the presence of pus, also whether the disease was contagious or not, and he wished to thank the

Society for the kind way in which they had received his paper.

The meeting was then adjourned till Friday, June 10th, when Dr. Maughan will read a paper on "Easy Mistakes in Dental Practice."

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

The sixth meeting of the Session was held on March 22nd, the President, Mr. W. Simms in the chair.

CASUAL COMMUNICATIONS.

Mr. D. **Headridge** showed a model of the upper jaw of a man about 70 years of age, with the right canine tooth just erupting.

Mr. G. **Kershaw** was then called upon to read his paper on "The Treatment of Children's Teeth," which appears on page 536.

Messrs. Simms, Linnell, Smale, Headridge, Tanner, Silson, and Lingford took part in the discussion that followed, the chief differences of opinion being as to the advisability of extracting the sixth year molars, as to the benefits accruing from lancing the gums, and the relative merits of the different filling materials for treating temporary teeth.

Mr. **Kershaw** having briefly replied, the meeting was brought to a conclusion.

Dental News.

DENTAL SURGERY IN THE CAPE COLONY.

The following are the rules and regulations for registration of dentists, passed by the Colonial Medical Council and approved :—

1. All dental qualifications, certificates, diplomas, degrees or titles recognised by the General Medical Council of the United Kingdom shall entitle the holders thereof to claim registration as dentists under section 18 of the Medical and Pharmacy Act of 1891.

2. In reference to the foregoing, any person claiming to be licensed and registered as a dentist under the Medical and

Pharmacy Act of 1891, on the grounds that he was in practice before July 22nd, 1878, will be required to produce the certificate of the General Medical Council aforesaid to that effect, and if his name be not upon the last published Dentists' Register he will be required to account for it satisfactorily to the Council.

3. The holder of any diploma of Lic. Dent. Surg., granted by any of the medical authorities of the United Kingdom, empowered so to do by the Dentists Act of 1878, shall not necessarily produce also the certificate of the General Medical Council aforesaid, but in such a case the Colonial Medical Council reserves the right of applying to the Secretary of the body granting such diploma, for information as to whether the name of the possessor is still upon the register or record of the body of which such person holds the licence.

4. Any applicant may be called upon to appear before the Colonial Medical Council to prove his identity or to give evidence as to his good character.

5. The Secretary shall from time to time write and forward (duly registered) a letter to any registered person, addressed to him according to his address upon the Register, to enquire if he has ceased to practice or has changed his address, and if no answer be received within six months his name shall be erased from the Register.

6. Any qualification, registrable in accordance with Rule I, acquired subsequently to first registration, shall be registered upon payment of a fee of five shillings.

7. All matters referring to Dentistry that may come before the Colonial Medical Council shall be in all classes referred to the dental member of the Council for his advice.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

Sir,—Will you allow me to disclaim the letter published in 'Society,' to which my name was appended. The letter was so altered and mangled by the Editor, that it would have been much better if he had omitted it altogether.

THOS. FLETCHER.

ANSWERS TO CORRESPONDENTS.

STUDENT.—We have read the page in the pamphlet, as you desire, and can sympathize with the disgust you feel. Although it is difficult to give a concise answer to your question as to the Dentists' Act, yet in our opinion, you are better off than your predecessors in the profession, and will be one of the coming generation to reap the result of the zeal and energy of those who fought for the passing of the Act. If the General Medical Council apply the same rules for "covering" in dental practice as they have already done for general practitioners there will be a remedy for the other grievance mentioned in your letter.

W.H.J.—We know of no association which would undertake a prosecution in connection with the advertisements you send us. With regard to your second question, you would have to be prepared with evidence that the individual in question had illegally described himself, or had given an affirmative reply when asked if he was a dentist.

Dental Hospital Report.

STATEMENT OF OPERATIONS performed at the Dental Hospital of London, Leicester Square, during the months of April and May, 1892.

		Apr.	May.
Extractions	Under 14	454	576
	Adults	1223	1349
	Nitrous Oxide	1104	1221
Gold Fillings		351	591
Plastic		791	1246
Treatment of Irregularities of Teeth—			
Artificial Crowns		28	38
Miscellaneous Cases		262	628
Total		4213	5649

House Surgeons PERCY WEBSTER,
CHARLES J. ALLIN,
ERNEST GARDNER.

British Journal of Dental Science.

No. 587. LONDON, JULY 1, 1892. Vol. XXXV.

TUMOURS OF THE JAWS AND GUMS.*

By William Thorburn, F.R.C.S.

Gentlemen,—It is no part of my intention to-night to endeavour to be "practical," or to attempt to give you information which may be of direct use to you in a profession with which you are naturally far more familiar than I am. On the other hand, I propose to recapitulate a few general principles of pathology, with which the busy man is hardly able to keep in touch, forced as he is to devote the bulk of his time to those subjects which have a more direct bearing upon the important task of earning his daily bread. Having thus taken the liberty of reminding you of a few of the theories which lie at the base of our present views as to the pathology of tumours in general, and of those of the jaws and gums in particular, I shall show to you as many varieties of these as I have been able to bring together, and shall briefly indicate the main characters and the treatment of each form, keeping entirely to the surgical as distinguished from the odontological point of view.

And at the outset I may perhaps profitably define what I mean by a tumour, in the pathological sense of the term.

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* An Address delivered to the Odontological Society of Manchester, on April 6th, 1892.

Clinically we use this word as applied to almost any swelling, but to the pathologist it has a much more restricted signification. The definition then which I shall adopt is slightly altered from the classical one of Cornil and Ranvier, viz., that a tumour is "a mass constituted by a tissue of new formation, having an inherent tendency to persist or to continue its growth." By this definition we exclude, as you will see, all those tissue—overgrowths which are of inflammatory origin, even when these appear to be persistent, as are the masses of tissue formed in tuberculosis and syphilis. These inflammatory swellings, however continuous in their growth, owe their persistence, not to any inherent tendency, but to the continuance of the cause which has given rise to their presence, be that cause a bacillus, a dead tooth, or any of the other numerous exciters of chronic inflammatory processes. It is much more difficult to frame a definition which shall exclude the hypertrophies, and this because nature herself has not provided us with any very definite boundary line between the processes of tumour formation and of mere tissue overgrowth or hypertrophy; but still the latter conditions have not the clearly marked tendency to continued progression, which we have regarded as the essential character of a tumour. Hypertrophy is generally traceable to some definite cause, and, if by any means we can remove that cause, then the hypertrophy will, as a rule, either disappear, or will at least not be continued. To enter further into the distinctions between these two pathological processes would lead us too far from the subject on which I am supposed to be addressing you to-night. And lastly, I may point out that all cysts are, by the definition which we are adopting, excluded from our consideration, these not being "constituted by a tissue of new formation," but consisting of mere spaces in the tissues, which spaces are filled with some, more or less fluid and non-living, material.

It is another established doctrine of pathology that all tumours must, and do spring from pre-existing tissue cells, and that they are never of extraneous origin. At one period, a favourite theory was that these masses were parasitic in their nature, that they were an implantation on the body, but the death-blow was long ago dealt to this view by Virchow, in his great work on "cellular pathology."

Now, those of you whose knowledge of embryology is not getting very grey, will remember that in an early period of its development, the human, and indeed the vertebrate embryo is a simple hollow organism, having its constituent walls formed of three distinct layers of cells. These layers are named respectively, from without inwards, the *epiblast*, the *mesoblast* and the *hypoblast*, and each of these layers has a definite part to play in the future development of the animal. Speaking generally, and omitting, for the sake of brevity, all exceptions, which in no way concern the study of our subject for to-night, we may say that the epiblast forms the epithelium covering the exterior of the body, together with those epithelial structures which arise therefrom, such as the sweat-glands, the breast and the invagination which gives rise to the lining membrane of the mouth. The hypoblast, on the other hand, gives rise to those epithelial structures which line the interior of the body, and their derivatives, such as the glands of the alimentary canal, &c. These two layers then, the hypoblast and the epiblast, are the original source of all the epithelia of the body, and, still omitting all irrelevant exceptions, all the other parts of the organism may be said to arise from the middle layer, or mesoblast. Thus then, we may divide all the cells of the body into two groups, those which arise from the epiblast or the hypoblast, and those which arise from the mesoblast. The former are all epithelial cells : the latter can be conveniently grouped as mesoblastic cells, and include the cells of the connective tissue, the muscles, bones, &c.

It is a remarkable and now generally accepted fact, that these two series of cells retain their individuality throughout the life of the animal, not only in physiological, but also in pathological processes, and that epithelial cells never arise from those of mesoblastic origin, or *vice versa.* This fundamental distinction is the basis of the combined developmental and anatomical classification of tumours, which is now generally adopted, and on this basis we divide all tumours into two great groups, the *epithelial* and the *mesoblastic*, because, as tumours always arise from pre-existing cells, they must take their origin in cells of one group on the other. In each of these groups we sub-divide the tumours according to their anatomical resemblance to one of the normal tissues of the body.

Taking the epithelial group first, we have normally two main forms of epithelial arrangement, that in which the epithelial cells grow down into the subjacent connective tissue, and that in which the connective tissue rises up in the form of *papillæ*, each of which is covered by an epithelial layer. To each of these varieties of normal arrangement there is a corresponding tumour, the two varieties being called respectively adenoma and papilloma. But we have also tumours consisting of epithelial cells which do not so closely follow any normal arrangement, but in which the cells are more or less indiscriminately thrown together, and are of a less well developed or more embryonic type ; these tumours are collectively known as the carcinomata or cancers.

In the mesoblastic group of tumours again,—in those in which the constituent cells are derived from the mesoblast,—as many varieties as there are normal varieties of mesoblastic there are tissue, each tumour being named by adding the suffix “oma” to the name of the tissue which it resembles. Here also we may have growths in which the cellular arrangement is "atypical" or embryonic and these ill-developed mesoblastic tumours are spoken of as the sarcomata.

Thus, then, we may set forth all the different varieties of tumour according to the following scheme, which is partly developmental and partly anatomical in its divisions :—

Epithelial Groups.

Typical forms :—

Papilloma ; having a papillary structure.

Adenoma ; consisting of downgrowths like those of a gland.

Atypical form :—

Carcinoma.

Mesoblastic Group.

Typical forms :—

Fibroma	consists of	fibrous	tissue.
Myxoma	,,	mucoid	,,
Lipoma	,,	fatty	,,
Chondroma	,,	cartilaginous	,,
Osteoma	,,	bony	,,
Myoma	,,	muscular	,,
Neuroma	,,	nervous	,,
Lymphoma	,,	lymphatic	,,
Angioma	,,	vascular	,,
Lymphangioma	,,	lymph-vascular	

Atypical form :—

Sarcoma.

It remains to be added that the atypical or embryonic tumours are as a rule highly malignant, whereas the typical forms are, generally speaking, innocent or benign.

And now with regard to the jaws, which in the discussion of these general principles have been too long neglected. It is very unusual to find any of the "typical" forms of tumour arising except in those regions of the body in which the normal prototype of tissue is to be found, and thus we find among the growths of the jaws and gums only those forms which are there represented. The "atypical" varieties may arise anywhere, it being always understood that carcinomata can arise only from epithelial cells and sarcomata only from mesoblastic cells.

In this way we can remove from the list of jaw tumours all those of which the originating structure is not found in the normal jaw or gum. We at once strike out the myxomata, lipomata, myomata, and lymphomata, and we do not practically meet with growths of nervous or lymph-vascular structure. The adenomata also do not occur in connection with with the alveolar portion of the jaws, although, as might be predicted from the nature of its lining membrane, they are not uncommon in the antrum. Our long list of tumours is thus cut down to the following :—

Epithelial tumours, which arise only from the epithelium of the gums.

- Typical form :—
  - Papilloma.
- Atypical form :—
  - Carcinoma.

Mesoblastic tumours, arising from the underlying tissues.

- Typical forms :—
  - Fibroma.
  - Chondroma } can arise only from bone.
  - Osteoma }
  - Angioma, can arise only from blood-vessels.
- Atypical form :—
  - Sarcoma.

Let me repeat with emphasis that in presenting to you the above considerations and classification, I have in the interests of brevity not seldom sacrificed minute accuracy to dogmatism, and that not all these views are beyond the reach of criticism

All that I have endeavoured to accomplish, before passing on to the consideration of the different common forms of tumour, has been to indicate to you the broad outlines of classification, and the laws upon which this classification is based.

(The remainder of the address was largely occupied with a demonstration of specimens, patients and instruments.)

Papillomata are primarily epithelial tumours arising from the mucous membrane of the gum, generally in connection with the irritation caused by a decayed tooth; not unfrequently the removal of the cause leads to the disappearance of the growth, which thus resembles a hypertrophy rather than a true tumour. Should this result not ensue, all that is necessary is the free removal of the papilloma, that is to say, it is necessary to take away the base, or to cauterise it, so as not to leave a nucleus for further growth. If this be properly done recurrence will not ensue.

Epithelioma,—the only form of carcimona here met with,—is of much more serious import, and is almost always recurrent after removal. Like papillary growths it is constantly due to some form of constant irritation, such as that produced by a badly fitting tooth-plate, and the early recognition and treatment of such a condition is of the utmost importance. One specimen shown was remarkable in the early age of the patient, who was a man of twenty-four, whereas as a rule these tumours do not appear until after middle life. The only possible treatment is free and early removal, which operation must include the excision of all surrounding parts and in most cases of the jaw itself.

Fibromata may arise from the connective tissues of the gum,—this form being commonly described as *epulis,*—or from the periosteum of the jaw or tooth, or it may originate within the bone itself, forming the endosteal variety. (The last form is not common and was not illustrated); The periodontal variety usually comes away attached to the fang of a tooth, which will have presented some obvious prominence. The distinction between those fibromas which arise from the gum and those which are connected with the periosteum does not appear to be very important, and I should advise the removal of a small wedge of bone in all doubtful cases so as to insure the eradication of the tumour. (Several specimens of fibromata were shown.)

Enchondroma is generally found only in early life—that is in the period at which cartilage is still a constituent of the jaw; it is much commoner in the upper than in the lower jaw, but it is not very common in either, and I have no specimens to show to you. This tumour grows more rapidly than does a fibroma, and presents a greater tendency to recurrence ; it may also attain to a very large size, and may even penetrate to the skull. For these reasons it forms a connecting link between the benign and the frankly malignant growths.

Of *osteoma* I am able to show you two well-marked varieties, the one consisting of soft porous bone, and representing the *cancellous* variety ; the other much denser in structure and illustrating the *ivory* osteoma. These tumours are non-malignant, but the operation required for their removal is often extensive, as, owing to their symptoms not being prominent, they do not generally come under the notice of the surgeon until they have attained to a large size.

Angioma, or a tumour consisting of abnormal and dilated blood-vessels, is found in connection with the gums, in the form of nævi, which are generally, but not always congenital in their origin. They may be treated by various forms of cautery, but the most convenient application is the galvano-cautery.

Sarcoma is one of the most malignant of the tumours of the jaws, being in this respect often more certainly and rapidly fatal than even epithelioma. It may arise in connection with the periosteum, or in the interior of the bone, and it has various forms, differing in their microscopic structure and in their malignancy. Many of these contain cysts, and others present masses of cartilage or bone. The treatment, if any be attempted, must be radical, and involves the removal of a great part of the upper, or of half of the lower jaw. (A patient was shown, the half of whose lower jaw had been removed eighteen months previously for sarcoma, and in whom there was no recurrence, but so favourable a result is not very common, and removal of the upper jaw for sarcoma is so unsatisfactory that the speaker seldom advises the operation.)

SUGGESTIONS OF A PLAN FOR PREVENTING LATERAL DISPLACEMENT OF THE CHIN, AFTER REMOVAL OF A PORTION OF THE LOWER JAW.*

By Stanley Boyd, F.R.C.S.

In bringing the following case and remarks before you, I must ask for some indulgence, for the subject upon which they bear is still in quite a plastic state in my own mind. I should not, indeed, have ventured to submit it to your criticism, had I not received a call from your energetic Secretary, and a request that I would help him in his task of providing food for the Odontological Society. I had not by me at the time any series of cases which seemed likely to be of interest to you, nor was I prepared to add anything to our knowledge of some abstract or scientific subject of common interest. But a case has recently been placed under my care by my colleague, Mr. J. F. Colyer, which had suggested to me that it might be possible in certain cases of removal of a part of the lower jaw, to prevent some of the distressing deformity which results from that operation—especially the deviation of the chin from the mid-line ; and as the result is due partly to Mr. Colyer's work and partly to mine, I hoped that the subject would be regarded as suitable for discussion by this Society.

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* Read before the Odontological Society of Great Britain.

It would be hard, indeed, to have to confess complete inability to deal with so striking a deformity, at a time when plastic surgery is so far advanced. When an ivory knee-joint has been substituted for the real article, and the possessor has been able to walk and to bend the joint through a considerable angle, it would at first sight appear to be an easy matter to build up a piece of the jaw. But we all know that asepsis is of the first importance in obtaining encapsulation of a foreign body, and that it is practically impossible to obtain this when a wound communicates with the mouth.

Moreover, even in parts where asepsis is easily obtained, and where one can without difficulty implant pieces of bone and periosteum, absorption of the graft and of any new bone which may at first have developed from it, has been the usual result. The best results have undoubtedly been obtained in the skull, where discs of bone removed by the trephine, replaced, whilst the bone-cells are probably still living, between vascular and perfectly aseptic surfaces of periosteum and dura mater, generally heal in and retain their bony character. Much more rarely an attempt to build up part of a long bone has succeeded, as when Macewen built up the lower end of an ulna with bits of bone obtained from osteotomies on ricketty children; and it seems clear that a piece of young, growing bone, thus transplanted, has a much better chance than a piece of adult bone of holding its own; and this chance is probably increased by the presence of periosteum on the graft, and on the undersurface of the flap beneath which it is to be placed.

In the case of defects of the jaw it would be only in the rarest cases that we could hope to fulfil the requirements for success with living bone grafts; and this no doubt has given rise to the feeling that it is hopeless to try and prevent displacement of the chin after resection of a portion of the jaw. Dentures of all kinds have, of course, been tried, but they get only a superficial, and, often, a very poor hold, so that they fail to counteract the force with which the shrinking granulation tissue drags together the sawn ends of the bone—just as our splints and bandages fail, under much more favourable circumstances, to prevent the contraction of a burn-scar. To succeed in preventing this contraction, dentures must be assisted by some kind of spanner between the bone ends. The question to be decided was whether a bar of some unabsorbable material could be got to heal in? At first I did not venture to try for this, but started with the idea that I should have ultimately to remove the spanner; but accident, as you will see, shewed that this may not be necessary.

Mary T., aged 20, had one of the front teeth in the left side of the lower jaw removed in October, 1889, to make room for another tooth. About two months after this she noticed a small tumour on the inside of the gum, near the seat of the extraction. It grew slowly for ten months when it had reached the size of a large Spanish nut. She then went to the Dental Hospital and was sent on to me at Charing Cross by Mr. Colyer. She was in the Hospital only from Saturday to Monday, and no notes were taken; but I remember that a ridge could be felt in the jaw, running down from the base of the growth near the line of the fang of the first bicuspid. A tooth was drawn on each side of the mass, it was then cut away freely with the forceps and a gouge was used along the ridge above mentioned. It was hoped that this treatment would be sufficient to prevent recurrence, as the growth seemed to be of myeloid nature.

But it reappeared after six months, in April, 1891, on the outside of the gum, about the second bicuspid (no doubt in connection with the ridge above mentioned), and increased rapidly, with attacks of sharp pricking pain.

She was readmitted on May 12th. There was then a tumour on the left side of the lower jaw pushing forward the lip ; it involved the jaw from near the midline to the first molar tooth and infiltrated the substance of the bone somewhat deeply, " expansion " being more evident towards the outer than towards the inner side ; but the lower edge of the jaw and the bone for a short distance above it were normal. The growth was lobulated on its free surface, smooth where it lay between the plates of the jaw, not ulcerated and not tender. The accompanying photograph shews the state of matters.

The growth had thus declared its real malignancy and a free operation was evidently necessary ; yet I was most anxious, if I could safely do so, to avoid breaking the continuity of the arch of the jaw. Accordingly, in order to see clearly the limits of the growth, the left central incisor and first molar having been drawn a vertical incision was made in the mid-line of the chin downwards from the groove between the lower lip and the mental prominence and then outwards along the lower border of the jaw to the masseter, the flap was raised and the mouth opened all along ; the jaw was sawn nearly through, just to the left of the mid-line, and through the socket of the first molar, and then with Liston's cross-cutting forceps a transverse cut was made below the base of the growth through what seemed to be healthy bone between it and the edge of the jaw. The tumour was thus separated from its attachments and removed, but the little bridge of bone (the lower edge of the jaw), which I counted upon to preserve the arch of the jaw was broken away at either end ; this was fixed in its natural position by wire sutures to the two main fragments, and the short ends of the sutures were brought out through the superficial incision. To them are due two deep puckerings in the line of the scar, and it is obvious that in future such stitches should either be cut short or the ends should be left in the mouth. To avoid deformity, union by first intention all along the skin wound should be obtained. I removed these two stitches after eight weeks, and the jaw then had quite a normal contour and was firm.

Unfortunately recurrence again took place about the last molar tooth, it was not extensive, and the bar of bone, which had been saved below the second growth, seemed quite healthy ; but I felt that I ought to seriously endeavour at the third operation to secure immunity from recurrence and determined to remove this bar of bone as well as the new growth. Had not the patient still begged me to avoid deformity, if possible, I should probably have removed the rest of the left-half of the jaw. As it was, on December 26th, 1891, seven months after the last operation, I opened up the posterior part of my old incision and extended it backwards to the angle of the jaw, separated the soft parts from each side, removed the bar of bone and about 1½ inch of the jaw, trenching largely on the base of the coronoid process. Partly to prevent flexion of the posterior fragment, partly to keep the two fragments apart until, at all events, a denture could be fitted, I broke off a piece of a stout steel knitting needle of suitable length and used it as a spanner, fixing the outer end in the dental canal and the anterior end in a pit bored in the anterior fragment. Mucous membrane and skin were sewn together separately over this and the jaw kept at rest. A small sinus in the skin wound remained and was attributed to the presence of the needle, therefore after six weeks or so I endeavoured to remove it, both from outside and the mouth, but I could not feel it anywhere. So I determined to wait and watch. The pricking and other abnormal sensations which the girl complained of disappeared at once and the wound soon healed completely.

Mr. Colyer's share of the treatment began three weeks after the operation, when he inserted a vulcanite splint to keep the parts separate. He says that "the mode of making requires but a few words, differing in no detail from that employed in making ordinary dentures. In order to assist keeping the splint in position, it was made to encircle the remaining teeth, and the bite was arranged so as to prevent lateral movements, the patient being recommended to keep the mouth closed as much as possible, and warned not to have it out for any length of time." This splint he has now replaced by an ordinary denture.

I think the result may be described thus : The patient is quite comfortable, she can separate her incisor teeth for at least an inch, and closure of the jaws is performed with considerable force ; the chin is in the mid-line, and the bite is perfect ; on the left side where the bone is absent the soft parts have fallen in and the depression is specially marked where the projecting wire stitches kept open granulating tracks for several weeks. Above the scar the cheek seems a little swollen, probably from impaired venous return ; this swelling is steadily subsiding. The left-half of the lower lip is wasted and causes some unnecessary disfigurement in the front view. I suppose a low branch of the facial was divided, though the incision used seemed unlikely to endanger any motor nerves.

It has occurred to me that in a similar case some of the deformity on the left side might be avoided by detaching the internal pterygoid from its insertion and allowing the masseter to draw the jaw somewhat outwards, also by using a thicker bar for the spanner, by placing it as nearly as possible on a level with the lower border of the jaw and by having it bent to the curve of the jaw.

I would particularly ask members of this Society for advice as to the best material to use for the spanner.

A CASE OF CYSTIC SARCOMA OF THE SUPERIOR MAXILLA.*

By Stephen A. Coxon, L.D.S.I.

The patient was one in whom the disease was associated with dental lesions, but ultimately revealed itself as "cystic sarcoma." The preparation of the tumour had been lent by the Dean of St. Thomas's Hospital. The case was brought to my notice by a colleague, Dr. Langton, on November 7th, 1890. The disease gave the patient very much the appearance that would have been caused by placing a large walnut under her upper lip. The growth was elastic to the touch and had a bluish red colour. The patient said it had been forming for three years, and commenced above a carious tooth, and had gradually grown larger. As she was pregnant she was anxious to avoid an operation; but her mouth gave her considerable uneasiness and pain. After taking into consideration the length of time the enlargement had taken to arrive at its present size it was hoped that it was not of a malignant nature. It was ultimately decided to open the swelling, and this was accordingly done on the following week, Dr. Langton giving chloroform. An incision was made right through the centre of the cyst; a small amount of glairy fluid was discharged on the entrance of the scalpel, and after that considerable hæmorrhage occurred. The cavity was plugged with "carbolized tow" which was changed every second day and the cavity thoroughly syringed out. Subsequent to this the swelling decreased to some extent and it was hoped that in time it might disappear. At the operation I cut away a small piece of the tissue, forming the wall of the cyst, and subjected it to a microscopic examination. The section was a very poor one, and it was therefore impossible to attach much importance to its examination, but at the same time it gave an unpleasant feeling that it was myeloid. In December, the swelling had not perceptibly increased, and in January its true nature became apparent. The patient was sent up to St. Thomas's Hospital, and on the 17th, Sir William MacCormac removed what proved to be a perfectly encapsuled tumour. The patient is very little disfigured by the operations, the incision was made at the angle of the mouth, and not through the upper lip.

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* Communicated to the Odontological Society of Great Britain.

The denture she is wearing was made in such a manner, that while it fitted round the edges and held out the lips, it did not bear upon that portion from which the tumour had been removed, thus avoiding any possible recurrence from friction or pressure.

The denture was made in the following way:—A piece of pure tin was taken about one-sixteenth of an inch thick, struck down to the model of the mouth, over the portion which it was wished the vulcanite should not touch. It was packed in the ordinary manner, and when the case was vulcanised, the tin was peeled away, leaving the vulcanite with a hard polished surface, but not in absolute contact with the part.

Since the operation, the patient had given birth to a fine healthy child. I believe this to be only one in many cases that come under the notice of dentists, and I fear that they often shrink from impressing on patients the necessity for an operation in such cases. It is of little use simply saying "You ought to see your doctor or a specialist about this," as the inevitable tendency is to shrink away from an operation, but it is our duty to see that the patients have medical advice, for early attention has saved the life of numbers of fellow creatures. Many little know the danger they are in until too late.

DOCTORS OF DENTISTRY IN GERMANY.—Several American Dentists in Germany have been fined by the Courts for using the title "Doctor." The only titles of "Doctor" recognised in the Empire are "Doctor of Medicine," "Doctor of Law," "Doctor of Theology," and "Doctor of Philosophy." It has been held by the Courts that anyone practising as Dentist and using the title "Doctor" although he may possess such a diploma as Doctor of Theology implies that he is a Doctor of Medicine, thus misleading the public. This will prevent those Dentists holding the D.D.S., or D.M.D., diplomas, calling themselves "Doctor."

British Journal of Dental Science.

LONDON, JULY 1st, 1892.

A CAMBRIDGE CONFERENCE.

This would seem to be an age of Congresses, and perhaps it is one of the necessary concomitants of a rapidly increasing population, and its new needs, that the individual shall become more and more merged into a crowd of his fellows. Instead of fighting for his own hand, as his prehistoric ancestor had to do, or for himself and his immediate circle as a later race found advisable, there is in these later days a still wider tendency to associate for common benefits, and possibly it is not going too far to suggest that this obtains in relative proportion to the extent to which what is called "civilization" increases and progresses. For the existence of civilization embraces the idea that Man is enabled to so interfere with natural laws as to modify the effects of his environment and to displace the ruder results of Nature's arrangements; and whether we instance the institution of hospitals for the preservation of the unfit, the preparation of foods by cooking, or the holding of congresses, civilizers can still attempt to meet objections by maintaining that the good to be derived is, after all, for the benefit of the individual.

For the Conference held last week at Cambridge, perhaps no excuse or apology is required. Taking advantage of the presence of the members of the Eastern Counties Branch of the British Dental Association, the President, Dr. Cunningham, arranged for an additional meeting open to ladies and visitors, in order that a discussion might take place upon "the paramount importance of dental hygiene and conservative dentistry during the period of school life; and the best means of securing their general application." This conference was held in Professor Liveing's lecture theatre in Downing Street, and there was a fairly large attendance of visitors, including several members of the University, and others interested in school training. There has long been cause for complaint amongst dental surgeons that the importance of the recognition and treatment of diseases of the teeth has not received the attention it deserves either from medical practitioners or the general public. To the ordinary lay mind it has appeared unnecessary to take much notice of the conservative treatment of children's teeth, and many who have themselves been restricted to periodical extraction of teeth "when they ached," seem unable to realize that there is a more excellent way, and think that what sufficed for themselves is enough for their offspring. The idea which prompts a consideration of such matters during childhood is good, and is probably the safest, and at the same time the easiest way of bringing home, at all events to the succeeding generation, the advantages to be derived. For if parents at the present day can be induced to inculcate the lessons of dental hygiene and to secure proper treatment for the children, these when grown up will be prepared for a continuance of useful habits. As in the case of other well-known questions it is desirable to "get hold of the children," and even if on some subjects there is a doubt as to the justice of prejudicing the youthful mind, instead of allowing it free scope for consideration and self-decision, we imagine few intellectual parents would carry this contention into dental affairs. Quite recently, however, there have been favourable indications on the part of the Medical Press, and in other directions, that a more intelligent spirit is awakening, and the fact that Sir James Crichton Browne, F.R.S., took the chair at the conference in question and showed an intimate acquaintance with the subject was in itself a hopeful augury. The reports of the local press, now before us, contain an excellent account of his address and the subsequent proceedings, but we shall be much disappointed if there is not an opportunity provided for a wider circle to read *in extenso* such a characteristic specimen of sensible matter being so tersely, and at times so wittily expressed. As might have been expected the speaker referred to the question of Education. Teeth, in his opinion, come before talents ; it is "preposterous to confer shreds of showy accomplishments on children who could not chew their food," and Sir James thinks that if adequate teeth culture could not be otherwise secured, even the grand piano in some of the London Board Schools should give place for a time to the dentist's chair. We can heartily endorse such an opinion, and in addition would merely point out that it is only making matters worse to endeavour to cram even ordinary knowledge into childrens' heads whilst the state of their mouths is responsible for the dyspeptic condition which results in brain and nerve starvation, or perhaps poisoning. The consequent morbid reaction completes a vicious circle and the wretched child is shackled with a chain, the succeeding links of which, as cause and effect, may be represented by overworked brain and starved tooth, neglected tooth and starved brain.

With regard to the method by which an improved state of things is to be brought about, Sir James was bolder than many of the hopeful workers in this subject. He is of opinion that it is the clear and pressing duty of Parliament to provide, in all public institutions for the maintenance of the education of the young, that the teeth of the children should be examined by a qualified dentist, and everything needful done for their preservation. At the Board Schools no doubt there would be resistance to any operative proceedings but there could be no objection to compulsory inspection of teeth, and the very existence of such a system would create public opinion in favour of sound teeth.

It is to be hoped that the permeation of the ideas promulgated by the distinguished Chairman, and others, at the recent conference may assist in bringing about a consummation so devoutly to be wished.

A New Dental Appointment.—We are glad to announce that, with the sanction of the Local Government Board, a dental surgeon has been appointed for the Central London School District. He is to make a weekly attendance and furnish a monthly statement for the House Committee, and a general report at the end of twelve months. The work will be so arranged as to secure an examination of each child every six months, those in the Probationary Ward being inspected on the first visiting day after admission. The record of the work done will show the character of the operations, and will give an opportunity of testing what proportion of conservative treatment is possible under such an arrangement. There seems to be every desire on the part of the School authorities to assist in this new departure, and the equipment includes a Morrison chair, dental engine, and other necessary instruments. When other authorities realise the fact that a similar necessity exists in the institutions under their control, it is to be hoped they will recognise their responsibilities, and follow an excellent example, so that before long the absence of a dentist on the official staff may be the exception.

We shall be glad if any of our readers will forward us copies of reports in connection with such appointments.

Post Graduate Teaching.—Systematic courses of instruction are still being carried on for medical men, who are thus enabled to keep themselves posted in all the most recent views and methods of the physicians and surgeons of the front rank. A somewhat analogous arrangement was made at the dental hospitals for practitioners a few years ago, and seemed to be appreciated. Sir James Paget in an address last week alluded to the erroneous impression that a license or diploma is a thing which not only conferred a legal right but a sort of moral right to practice. Sir James held that it did nothing more than declare that the person who received it was fit to practise on the day on which it was conferred, and that it would depend upon the holder himself whether he would be fit ten years later. The only way is to remain constantly a student, and, although the circumstances are not precisely parallel, it would seem that dental practitioners may apply the above remarks to themselves and, in default of post graduate classes, should lose no opportunities of attending demonstrations and other professsional meetings which may be open to them in order that they may observe the application of even well-known facts by others.

Homeopathy in America.—Dr. Gould, of Philadelphia, has been addressing some young graduates upon the prevailing epidemic of Quackery, and seems to have especially attacked homeopathy. Taking the street-corner man who sells Wizard Oil with negro-minstrel accompaniment, and four white stallions as at the top of the list and represented by the figure 100, the lecturer thought the Hahnemannian Knights, according to the degree of their medical education and the weakness of their potentizations, may be ranged from 95 to 75, whilst the writers of therapeutic articles on drugs that they know nothing about, are estimated at 25. Convinced that people need and will profit by simple instruction properly put before them, Dr. Gould offers a prize of 100 dols. for the best essay (of not more than 15,000 words) which will "historically and actually show up the ridiculous pretensions of modern homeopathic practice." It will be printed in large quantities and supplied to physicians for gratuitous distribution as a missionary tract. We shall watch with some interest for the results of this suggested remedy and whether it calls forth a counterblast. Meanwhile should not the man with the Wizard Oil also be allowed to distribute the missionary tract if he wishes, so that peradventure any stray homeopaths in his crowd may benefit?

THE INCORPORATED EDINBURGH DENTAL HOSPITAL AND SCHOOL.—At the end of thirty years' work it has been found necessary to put this Charitable Institution upon a new basis, and those interested in its continued success resolved to take advantage of the Companies Act of 1867, and to register a Society by authority of a license from the Board of Trade. The result is that the benefits of an Incorporation are secured without the expense of applying for a Royal Charter. There is a limited liability to all shareholders, and all monies received are to be applied solely to the purposes of the Institution. The list of 15 names on the Board of Directors seems a very strong one and fully warrants the belief that this charitable scheme will prove a success. The prospectus contains an interesting statement of the evolution of the Institution from the days when it depended upon the private exertions of a few individuals, who received no public support, down to the present year when the possibility of being disturbed by the necessary enlargement of the Royal Infirmary led the Directors to anticipate and prepare for a removal by securing premises of their own. They now appeal to the public on behalf of the Dental Hospital as a Charitable Institution which provides gratuitous treatment for the poor, but we have no doubt that many Scottish members of the medical and dental professions will also be found to support such an excellent and representative teaching centre in Edinburgh. The Capital asked for is £10,000, divided into 10,000 shares of £1 each, and we shall be glad to hear that a full allotment has been made.

GENERAL HOSPITAL, LAUNCESTON, TASMANIA.—The annual report of Dr. Drake, the surgeon-superintendent, shows that in the dental department there has been a steady increase in the number of persons seeking advice and treatment, and we are glad he can point out that many of the operations are of a conservative and reparative character. This result has been greatly facilitated by the addition of a number of necessary instruments and appliances, such as a dental engine and proper operating chair. In the dental School a course of lectures and demonstrations has been given to the Students in the different subjects prescribed by the curriculum under the Dentists' Act of 1884. The number of lectures in the different subjects varies from fifteen in the course on Metallurgy to twenty-five in Dental Anatomy and Physiology, so that it would seem that the antipodean student is expected to imbibe his knowledge in much the old-fashioned way. It is, therefore, pleasant to find that "the attendance and general conduct of the students has been regular and good." Two in-door patients and fifteen out-door received treatment in connection with "dentition," which is placed in the list of diseases of the Digestive System.

REPORT ON METROPOLITAN HOSPITALS.—The select Committee of the House of Lords has published a document of over 100 pages of the evidence, given before the Committee, under seven general headings. No. 2 deals with special hospitals, and although dental hospitals are not subject to the same objections as some others, there is a danger of abuse. While admitting the objections to over-specialisation, the Committee recognise that specialisation is a necessity. After all the evidence presented to them, it seems to the Committee that the hostility so widely shown by the medical profession to special hospitals arises from the fact that numerous small hospitals for special diseases have been instituted by medical men for the purposes of their own advancement, and that such a course of action leads to the establishment of hospitals where they are not wanted, to waste of money incident to the creation of badly managed and small institutions, and to the deception of the public by inducing them to subscribe to undertakings alleged to be of public benefit, but which are in reality mere schemes for private emolument, and also are useless for teaching purposes.

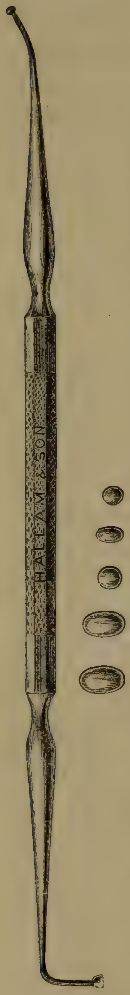
The Committee consider that the charge of abuse is substantiated in regard to some small special hospitals. This class of small special hospitals to which the Committee refer, of which examples appear in the evidence, the Committee do not consider of any real benefit either to the sick or to science. They appear to be carried on sometimes in incommodious buildings, or under insanitary conditions, and the Committee would deprecate the multiplication of such institutions.

GUY'S DENTAL STUDENTS AND THE L.D.S.—In the first letter on this subject which appeared in the *British Medical Journal* it was alleged that the candidate's mechanical work was referred to Mr. Watts, the curator of the laboratory at Leicester Square. This gentleman promptly and absolutely denied the students' statement, and asserted that at no examination had any case been referred to him by any examiner. Now, still later, one of the Guy's students, who was successful, returns to the charge on behalf of another, who, apparently, did not pass. We wish the Guy's School every legitimate success; there is plenty of room for healthy emulation, but the fact that all its candidates did not succeed is scarcely sufficient ground for making charges and refusing to accept a denial. This young School has all its time before it to earn a notoriety of another sort, and in a more worthy manner. We are glad to find there is no repetition of the bitter cry for a "representative," and trust that the valuable space in our contemporary's columns may be devoted to more important matters. From what we have heard, an attempt was made to induce other hospital students to take action, and that at all events in one direction the suggestion was unanimously repudiated, and regret expressed at the attitude taken at Guy's.

Manipulative Miscellany.

All new instruments or articles that it is wished to have described under this heading, are requested to be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being, to give practitioners a description of everything new, on its own merits, and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

BRAUN'S PATENT MAGNETIC CARRIER.



THIS is an ingenious application of a magnet for the purpose of conveying small metal concave discs to any particular spot in the cavity of a tooth. We have found that, in this way, the disc may be picked up and charged with medicaments, either with a view of preserving or destroying the pulp, and then placed in the required spot with great exactitude, with more ease than with the forceps, besides allowing, at all events in some cases, a better view. If necessary the disc can be disengaged from the end of the carrier by holding the former *in situ* with a fine instrument and withdrawing the latter. Messrs. F. H. Hallam & Son, who are the manufacturers, also supply with it 100 of the "nerve caps" in different shapes and sizes.

Review.

A Manual of the Dental Laboratory By Charles Hunter.
London : Ballière, Tindall & Cox.

As will be seen from the title this useful book is not a treatise on Mechanical Dentistry, but gives the results of the author's experience in the arrangement and management of the Dental Laboratory and its contents. Chapters VII. and VIII., however, contain references to actual practice and manipulation in connection with the uses of the different forms of mineral teeth, and the altering and repairing of dentures. In regard to tube teeth a regret is expressed that they are now but seldom used, especially as in certain partial cases they most fittingly supply the places of the natural teeth lost, and give great comfort to the wearer. The complete dentures of former days, of gold plate and tube teeth may probably be considered in the present time practically extinct, being superseded by the system of soldering attachments to the plate and vulcanizing the teeth to it. Whilst the author thinks that in the majority of cases this is both expeditious and satisfactory, he emphasises the necessity of the attachments being judiciously fixed to the plate.

The book contains the opinions of some well-known practitioners on some subjects upon which the author does not consider his own personal knowledge so valuable, but of course the work will not be relied upon to teach pupils, it being more useful as a book of reference with regard to the way in which an experienced dental mechanician has found it advisable to deal with various points arising in the daily work of a laboratory. At the end of the book are notes on the preceding chapters, as well as a collection of laboratory hints and suggestions, and an Appendix.

RUBICREME.

Menthol	2 scruples	Tincture of myrrh ...	4½ oz.
Oil of cloves ...	1½ dr.	,, cudbear (N.F.)	2 ,,
,, peppermint ...	1½ ,,	S.V.R. 10	36 ,,
Boric acid	9 ,,		

Dissolve the menthol and boric acid in 20 oz. of the S.V.R., add the oils, and then the tinctures ; filter, and add S.V.R. to make 36 oz.

Abstracts of British & Foreign Journals.

THE CODE OF ETHICS IN ITS RELATION TO THE PRESENT NEEDS OF THE DENTAL PROFESSION.

By Rodrigues Ottolengui, M.D.S., New York, N. Y.

The author thinks that no amount of written law will convert a blackguard into a gentleman, nor make a charlatan a professional man. What it will do, however, and what it is doing all over that country, is, that by specifying a mode of punishment for slight wrongs, it enables the charlatan who cries so loudly that he is professional to grind down the poorer man who is his neighbour, and who is attempting to rise. It enables this ass who hides his true form in the skin of a lion to terrorize his brother-dentists, so that while they scrupulously follow the code, he is surreptitiously lining his own pockets. He builds up his practice by methods just without the pale of the code and its punishment, and to which his neighbour would not descend, code or no code. The code is so elastically drawn, that it will exclude what might be considered legitimate and honourable advertisement, while it permits, or at least cannot punish, advertising which is far more profitable to the man, though unworthy the gentleman.

In his position as chairman of the executive committee of a society, his attention has been drawn by many men, both in and out of the society, and in and out of the state, to certain so-called infringements of the code, with the expressed wish that he should give an official opinion upon them. For example, he had been asked whether or not it is not advertising for a man to write an essay, and then to circulate the reprints of the same. He has looked into this rather exhaustively, and found that it is commonly done among physicians whose code we copy. It is done, too, with the distinct intent of advertising the ability of the author. True, the circulation is generally limited to medical men. But it must not be forgotten in this connection, that the spirit of advertising is to increase patronage. In the medical world, we find that the field is so large, that it is cut up into many separate departments called specialties. In each, the specialist restricts himself to his one line of practice. Thus, the gynecologist feels perfectly safe when he sends a patient to an oculist, because he knows first, that the oculist will do nothing to prevent the return of the patient to himself for gynecological service ; and secondly, he knows that the favour will be reciprocated and that the oculist will some day send him a patient. Thus the distribution of reprints among physicians is not only advertising, but it is advertising in the most promising field. If the same reprint reaches the patient direct, it will not have as much effect as when it goes to another practitioner, who, becoming convinced by it, then advises his patient to seek the author for assistance in line with his specialty. But it is also permissible in certain directions for the physician to send his pamphlets direct to his patients, as for example, innumerable dietetic lists headed with the name and address of the physician recommending them. This is a common and growing practice. A card of this kind is kept by the patient, and is not only passed to others, thus helping the physician by spreading his fame, but it is beneficial to society in circulating wholesome advice. Thus it would seem that the dentist could cite ample authority for the mailing of reprints either to his colleagues, or to patients.

From the dentist's standpoint, there is little advertisement in sending reprints to fellow-dentists, for it is a well-known fact that dentists do not send their patients to other dentists, at least not to men in their own city, except for free consultation. This brings us to a consideration of the distribution of the pamphlets among his own patients. The author believes that under our present code, a strict jury would decide that it is a breach to do this. Yet, if so, then the code is plainly militating against one set of men to the advantage of another. If Dr. A can do a thing thoroughly well, and Dr. B can do it not only as well, but also has the ability to write a lucid, comprehensive description of his work, he is a more useful man than Dr. A. Then if Dr. B does write a description of his work, and publishes it, does he not place his professional brethren under obligation to him, since he suggests to them, and enables them to do, a new and useful operation ? Should those beneficiaries be able to appropriate his brains and labour to their own uses, and then, hiding behind the code of ethics, have the right to prevent Dr. B from reaping that reward from the public which he will never obtain from the dentist, except from those who like himself are constantly giving to the multitude, and receiving nothing in return? The author holds that a man has the distinct right to manage and control his practice to his own best advantage. It must be remembered, in the first place, that to advertise among strangers, is true advertising. To send reprints to one's own patients is totally different. These patients constitute the field of a man's practice, that he has already gained. If he has the brains to write a pamphlet, why should he not have the privilege of sending it to those who are already attached to him? Why should he not have the right to make these persons better aware of his ability, thus increasing their confidence in him, and at the same time rendering it more difficult for his unscrupulous neighbours to wean them away from him? For these neighbours, who so love the code, will not hesitate to advertise themselves with their tongues, since they cannot do it with their pens. The truth is, the reprint scheme is less condemned among physicians, because physicians, as a class, have more literary ability. More of them are able to be authors and partake of this method of advertising.

In setting up this line of argument recently, the question was asked, "Why could not these reprints, sent to patients, get into the hands of other men's patients?" The reply is, that where that happens, so much the better for the clever writer, and so much the worse for the other man. If he cannot keep his practice more attached to himself than this, he deserves to lose it, and the probability is that the patient will be benefited by the exchange. Besides, is not this exactly in line with legitimate methods of attracting patients? A woman, living in a boarding-house let us suppose, goes to a dentist, and has considerable work done. A number of conspicuous and beautiful gold fillings are inserted. She shows her teeth to other women in the house. They at once draw comparisons between their own work and that which is shown to them. If the difference is to their own disadvantage, they change their dentist. This man has advertised himself through his work, and through the confidence which he has inspired in his patient. Where, then, is the difference with the reprint? If the reprint convinces his patient that he is a skilled man, why should she not have the right to boast for him to her friends, and why should he not have the emoluments accruing therefrom? The field is not an exclusive one, except so far as the ability to enter is. It is not like paying for a newspaper advertisement, for that is open to anyone who has a pocket-book. The other is advertising, if you please, but it is advertising that is but the just desert of the man who has spent his nights in study, and thus after long waiting, gains prestige and patients, while his neighbour has been increasing his own practice by systematically working his church, his club, the tradespeople with whom he will only trade on a plan of reciprocity, and his friends whose confidence he gains over numerous bottles of wine.

The code of ethics, then, strictly construed, would term the distribution of reprints as objectionable advertising, and therefore contrary to professional spirit. Thus the student is tyrannized over, and remains a true professional man, but a poor one. Why? Because he devotes his nights to study.

How does the code control the other man, who sells his text-books after procuring his degree? Here is a sketch of such a person. As soon as he gets his office started, he goes to live in a large boarding-house. He works the whole house into his ledger accounts, and then he moves to another boarding-house. Has he broken any specific rule of the code? Not yet,—or at least you could not convict him of it. Soon he joins the church, and perhaps the choir; he becomes an active member of the Young People's Society. He fills the preacher's teeth and sends him a receipted bill, and in exchange the preacher tells everybody in the church. Is there anything in the code against joining the church and doing gratis work for the clergy? I think not. He starts several entertainments for the benefit of the church debt. It is mainly through his energy that they are successful. He also heads as many subscriptions as possible. In fact, he makes himself popular in that church. Meanwhile he joins a man's club. Here he spends his off nights. He becomes an adept at billiards, and he plays a good game at ninepins. He wins a few tournaments, and stands treat for the crowd. He gets upon the executive committee, and his great executive ability shows him the way to get most of the club men into his office.

One day one of the elders of his church comes in and shows him a reprint bearing the name of a man whom he knows is a skilful dentist. The pamphlet, too, is one of merit; the writer describes therein a useful operation original with himself, and beyond the ability of our friend, who has done no studying since he left college. What does he do? His commercial instinct comes to the front, of course. He at once denounces the writer of the pamphlet as a charlatan. He says to his patient, "Why, my dear sir, the thing shows on its face the man is a quack. Don't you see it is an advertising dodge? Don't you know that no reputable professional man would stoop to this sort of thing?" He has the confidence of his hearer, and of course wins him over. But has he behaved in a truly professional spirit? Yet where does the code come in, in this? It does, to this effect. A charge is made against the offending author, and he is either publicly punished by his society, or else his accuser, fearing to make so open a stand, goes about among others of his kind; they band together, and systematically do all they can to injure the man whose work has benefited them all, but who has dared to try to advertise his own ability, which he has earned by such hard labour.

The author thinks the present code is utterly useless. First, because it does not describe specifically all that which should be against the spirit of the rules; secondly, we have various forms of the code adopted by different societies; and third, it is practically a dead letter in that it permits sins in one direction, which are as bad, or worse, than those designated for punishment.

He suggests that a committee be appointed by the American Dental Association to co-operate with one from the Southern, and that these two shall decide first whether or not a code benefits the profession. If so, then let them formulate one which will fit the present status of dentistry better than this relic of bygone days.

In the first place, let them designate in no uncertain terms what is, and what is not, obnoxious advertising. Let them say that a man shall not advertise in the public prints, paying for the same. That he shall not invite a friendly reporter to describe his office and himself in glowing terms. That he shall not, because he has a corner house, make that an excuse to have a sign on both streets. That he shall not object to his neighbour's handbills, while he himself has a handsome door-plate so large that a person can read it half a block away. This sort of thing is inconsistent. Let them, in fact, say exactly how large the sign may be, and what may be placed upon it. Let them tell what we may or may not put upon our cards. Let them say whether or not we may move twice a year and send a notice to every patient, under the flimsy excuse of removal. Whether or not we may have two offices, and alternate between them, using the removal notice as a device for keeping our practice together. Let them tell us if we may put half a dozen degrees after our names every time we sign them. Let them say whether or not we may give free lectures on dental topics in public schools or in churches. Let us know if we may be interviewed by reporters, and if so under what circumstances. Let us know if we may write upon dental subjects for the education of the masses, and whether we may sign such articles or not. Let us have a distinct solution of the reprint question. Let us know whether or not we may show one patient the model of work done for another, and if we may admit in public or in private that we are dentists. In short, let us know if we are to have any liberty at all, and if so exactly how much. Let us know the length of the chain which binds us, so that we may all be bound alike. Thus let us escape the thralldom which now shackles one man hand and foot, while the next, through chicanery, may have the freedom of the city.

Then let the committee get down to a consideration of fraternal courtesy. Let us know how much we may criticise the work of other dentists ; how much we may say against their personal and private character ; whether or not we can do this sort of reviling among dentists, so long as we do not repeat these scandals to patients. Let us know just how much courtesy we owe to each other ; also how little we may display and pay the debt. Whether it is proper to allow our names to go down on society programmes and then not appear. Whether we can borrow money on the plea of brotherhood, and return it or not as is best suited to our convenience. Especially let us know whether it is good ethics to print a calumny against another dentist, and then mail it to all his local associates. Let us know how far we may go in personalities in our journalistic writings.

These specifications of the requisites of a code, of course, are exaggerated exactions. But if we must admit that we need rules for the guidance of our conduct, then in our pusillanimity let us confess honestly that we do not know how to act with courtesy, integrity, professional justice, and fraternal feeling, and that in this predicament we need some wise father to write out for us, in the most minute detail, how we are to guide our lives.

The Dental Cosmos.

THE PRESENT POSITION OF OUR KNOWLEDGE OF INFLAMMATION.

By Dr. THEODOR LEBER,
Professor of Opthalmology in the University of Heidelberg.

IN earlier times the opinion prevailed, that all foreign substances that entered the tissues of the body must necessarily give rise to inflammation. This belief became untenable by the knowledge derived from the antiseptic treatment of wounds; and also from experiments conducted upon the lower animals. For it was shown that chemically inert substances introduced aseptically into the body, could remain there indefinitely without causing any inflammation in the clinical sense of the word ; nowhere can the truth of this theory be demonstrated more easily, or more plainly, than on the eye. If we introduce through a small wound, made with due antiseptic precautions, a suitable piece of gold or glass into the anterior chamber of a rabbit's chamber, no inflammation is called forth. It is true, however, that changes are caused by the presence of even such inert bodies ; certain degenerations and proliferations occur in the tissues of the eye, especially in the retina, which are scarcely apparent, and absolutely different from these following an infection of the wound. Indeed, many maintained that though inflammation in general could be occasioned by the action of chemical irritation, the production of pus was peculiar to certain micro-organisms.

It was proved, however, by experiments that not only the products of such organisms, but also pure chemical substances, possessed the same capability of calling forth purulent inflammation. Among the pus-producing chemical substances quicksilver stands in the first rank. A single drop rendered absolutely sterile by heat, antiseptically introduced into the anterior chamber of the eye of the animal, always gives rise to a circumscribed collection of pus in its immediate neighbourhood, which in the course of time can even lead to purulent infiltration and softening of the inner layers of the cornea. But purulent inflammation set up by the action of chemical substances has not the same power of extension as that due to the action of microbes. In chemical substances, only the limited quantity which has been introduced into the body comes into action ; and the anatomical structure of the affected part, very often restricts its extension. Thus the inflammation caused in the eye by chemical agents, remains more or less limited to the affected area.

Although some chemical substances can call forth purulent inflammation this power is not possessed by all which have a powerful irritating action. Croton oil and cantharides, for instance, cause, under ordinary circumstances and by aseptic introduction, no pus, but a more fibrinous exudation with necrosis of tissue, though their action on the vessels is much stronger than that of quicksilver and copper, and other chemicals which cause pus. Nevertheless by a special method of application some such substances, notably croton oil, can cause suppuration visible to the naked eye, if its action be weakened and limited to a certain spot. Other substances, as arsenic, have, in comparison with their strong necrotic action, only a slight power of provoking inflammation, and therefore belong to a separate class. The cause of the difference in the mode of action of the various substances is not yet understood, and is not explained by their known chemical affinities.

All powerful substances capable of exciting inflammation are, in a concentrated form, poison to protoplasm. They cause necrosis; and, in a less concentrated form, they cause those changes in the vessels and their contents upon which the occurrence of inflammation depends. Another important circumstance to be noted is the relative solubility of these substances. Severe inflammation is not to be expected from the easily soluble, but, on the contrary, from the slowly soluble foreign bodies. Very irritating substances which are easily soluble will, in concentrated solutions, rather destroy the organ than produce inflammation. In weaker solution they will be too quickly absorbed to produce any visible effect. Slowly soluble bodies, on the contrary, will, it is true, act upon the tissues only in weak solutions; but this action is a continuous one, and is confined within the limits where the vital powers of the tissue elements, which are necessary for inflammation, are still preserved, whereas a too powerful agency does not lead to inflammation, but to necrosis.

The process of the migration of the white blood corpuscles observed under the microscope on the living animal has furnished the true explanation of the appearance of the pus cells, which was otherwise incomprehensible.

The occurrence of necrosis within the microbic area and in its immediate neighbourhood, and of inflammation at a distance, is to be explained by the supposition that at this distance the injurious substances are not sufficiently concentrated to cause death, but only to produce those changes in the vessels and their contents on which inflammation depends. The dilatation of the small veins and capillaries in inflammation may be regarded as the result of a toxic paralysis of the cells of the vessel walls, causing loss of their tone, and an inability to resist the pressure of the blood. Upon the widening and greater permeability of the vessels, together with the slackened circulation, depends also the increase of the transudation of the plasma, which regularly occurs in inflammation. The emigration of the leucocytes, on the contrary, is not to be regarded as a purely passive process. They are not simply pressed through the spaces in the vessel walls, but pass through by means of their amœboid movements, after first lining the inner surface of the vessel wall. Concentration of the injurious substance causes a paralysis of the cells, and its dilution exercises a stimulating action, causing the cells to direct their movements towards the point of the great concentration. Under any other supposition it is impossible to understand why the cells press forward so densely in the neighbourhood of the microbes; and how they manage to overcome such obstacles to their movements as present themselves. This theory is confirmed by direct observation.

Influences of the same kind as we have assumed in the movements of the leucocytes are active also in many other cells of very different character, as well in animals as in plants. The botanists have given to this process the name chemotaxis. Very similar to the chemotaxis of leucocytes is that observed in one-celled organisms, as in certain bacteria, whose movements in a fluid are excited through appropriate food substances, so that they are allured in great numbers to the food material; whilst other substances, and even too strong a concentration of the food material, have a repelling action

As to the mode in which the accumulation of the leucocytes can be of benefit to the damaged tissues, we must first mention their ability to take up into their substance, and remove, all finely divided foreign bodies. By this means they are able to free the organism from all intruding substances. The liver is the chief deposit of these cells laden with foreign bodies, which are there disintegrated, or in other ways rendered harmless.

Recent investigations have shown that the power of the body to kill micro-organisms, or to render them harmless, is not the property of the leucocytes alone; the blood and other tissues or fluids possess this power in a still higher degree.

There is still another property of the leucocytes, namely, the power to soften, and finally to throw off organic substances, especially dead portions of the body. This softening is to be attributed to the action of a ferment which must be produced by the leucocytes and not by the micro-organisms. Although certain positive results have been obtained, this tissue-softening ferment has not yet been isolated. It is, however, possible to demonstrate that leucocytes alone, in the entire absence of micro-organisms, have the power of softening and dissolving the tissues. The processes in the tissues and organs of the body which are caused by the action of foreign substances are, as we have seen, most numerous and complicated; and especially so because all these various processes occur and act in unison. They vary in their nature and degree with the influence of the external injury, all the processes having the character in common of being directed towards the attainment of a definite object. Thus, inflammation is to be looked upon as a conflict which the organism maintains against the injurious influences from without.

It is evident that our treatment of inflammation will be influenced by our recently acquired knowledge; for we shall deal with these processes in an entirely different spirit if we no longer consider them to be injurious in themselves, but rather the unavoidable consequences of the damages from without, which damages they ever aim to remove. Then shall we understand that our therapeutic efforts should be chiefly directed against the causes of inflammation, and that they should not combat, but, on the contrary, aid this *vis medicatrix Naturæ.*

British Medical Journal.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary Monthly Meeting, May 2nd, 1892. Mr. J. H. Mummery, M.R.C.S., L.D.S., President, in the chair.

The minutes of the last meeting were read and confirmed.

Messrs. J. E. HARRIS, and EDMUND BALDING, Jun., signed the Obligation Book, and were formally admitted to the membership of the Society by the President.

The following gentlemen were ballotted for, and duly elected :—

Resident Member :—Mr. HARRY DAVIS, L.D.S. Eng., 14, Church Road, Richmond, S.W.

Non-Resident Members :—Messrs. DAVID THOMSON, L.D.S. Edin., 15, Gt. Marlborough Street, W., and PHILIP BURDETT, READING, L.D.S. Eng., Elizabeth Street, Hyde Park, Sydney, New South Wales.

The LIBRARIAN (Mr. ASHLEY GIBBINGS) stated that the Society had received the following books :—*Transactions of the Odontological Society of Germany ; Official Year-book of the Scientific Societies* ; a treatise on " Harelip and Cleft Palate," by Mr. William Rose, F.R.C.S.

The CURATOR (Mr. STORER BENNETT) announced that he had received two teeth, presented to the Museum by Mr. Oswald Fergus. In each case, the tooth was a first lower molar possessing three fangs.

Mr. STORER BENNETT also exhibited, and deposited in the Museum of the Society on loan, the skull of a Malayan Bear (*ursus malayanus*), which showed evidence of having suffered from three extensive alveolar abscesses, arising from three out of the four canine teeth.

The left upper canine was broken short off at the neck, and pus had thus been able to escape through the exposed pulp cavity, the surrounding bone was therefore but little impaired, The abscess connected with the right upper canine had burst into the nose, involving considerable destruction of osseous tissue. A remarkable point about this tooth was, that although the apex had been completed, and the end of the tooth and its inner side were intact, there was considerable destruction of the thin outer side over an area of quite half-an-inch.

An abscess was also situated at the end of the left lower canine, but here the end of the root was quite open, no attempt at closure having occurred. The bone of the lower maxilla beneath the tooth was extensively excavated, and masses of new bone were thrown out from the edges of the cavity, partly bridging it over.

The bear had been kept in captivity, and Mr. Bennett took it that the reason why so many wild animals that had been caged developed multiple abscesses, was that the irritation caused by the trouble with the first tooth was so great that it caused them to grind their teeth against the bars of their cage, and thus much more extensive damage was done subsequently. In this instance, Mr. Bennett was of opinion that the first canine was initially affected.

Mr. S. A. Coxon narrated "A Case of Cystic Sarcoma of the Superior Maxilla," as published on page 591.

Sir Wm. MacCormac, being called upon by the President, said that he did not know that he had much to add to the description of the case. The patient, when she came under his notice, evidently had a central tumour of the upper jaw, presenting itself on the outer side of the alveolus. It was thought that probably it would prove to be a myeloid growth, and after examining it and deciding what had best be done, he removed it by clearing away the tissues all round, and thoroughly removing it beyond the limit of growth. This was readily done by making an incision near the angle of the mouth. The tumour was very completely encapsuled, and it came away without difficulty. In his experience myeloid tumours were much more rare in the upper than in the lower jaw; and this, he thought, would show itself of the least malignant type of sarcomatous tumours. Mr. Coxon had mentioned that the operation had resulted in very little deformity, Sir William MacCormac thought, that in this case there was no need of it; the angle of the incision could be made either shorter or longer in one cheek, and in this way almost any growth could be removed from either the upper or the lower jaw, there need not be any unsightly scar left. It was perhaps a matter of detail, but it was of great importance to bring the edges of the mucous membrane together very accurately, for primary union then took place much more rapidly. Partly on this account, and partly owing to the very admirable way in which Mr. Coxon had fitted the artificial piece, he thought that when they saw the patient they would say that very little deformity was apparent.

Mr. FREDERICK EVE suggested that for the sake of clearness, Mr. Coxon might slightly modify the title of his communication : the term "cystic sarcoma" was originally used for epithelial tumours—multilocular cysts orignating in the epithelium. Mr. Coxon's case was really one of "Central Myeloid Sarcoma of the Jaw," and he would suggest it should be so described.

Mr. STANLEY BOYD asked Sir Willian MacCormac if a median incision carried into the nostril would not have given better access than the one made.

Sir WILLIAM MACCORMAC thought the incision made was the better one, though the one suggested would have been necessary had the tumour been more extensive. By his incision he had limited the scar more than would otherwise have been possible.

Mr. STANLEY BOYD then read a communication on "Suggestions on a plan for preventing lateral displacement of the chin after removal of a portion of the lower Jaw," which is published on page 585.

The PRESIDENT remarked that there were a great many interesting points about the case, and he should like to hear the opinion of members and visitors upon it.

Mr. F. NEWLAND-PEDLEY said he thought Mr. Boyd was to be congratulated upon the success of his case ; it was most ingenious and very successful, but it must not be assumed that they had always failed hitherto by processes which were familiar to them. He must admit Mr. Boyd's plan was entirely new to him. He had always found a difficulty when removing part of the jaw in preventing deviation to the opposite side, and there was no appliance known to them which would keep the chin in position. In a case of removal of necrosed bone, Mr. Newland-Pedley had used the Gunning splint, which was worn by the patient for five months, but in this instance he had the advantage of the periosteum remaining. In another case in which a portion of the jaw containing three teeth was sawn out, he was unable to accomplish anything by artificial contrivance without displacement. The ingenious part of Mr. Boyd's case seemed to be that he managed to pin the pieces together. He should certainly take a lesson from Mr. Boyd's experience.

Mr. J. H. BADCOCK stated that a somewhat similar case came to him in the autumn of 1890. The patient suffered from necrosis of the lower jaw. He was a patient of Mr. Rose's, who resected a portion of the lower jaw from the periosteum, leaving the ramus. Mr. Badcock saw him some few days afterwards and the chin was drawn considerably to the left side. A Gunning splint was applied but the part left gave so much trouble that Mr. Rose resected that also. The splint however, did very well. About three or four weeks later the man left for America. At that time the periosteum seemed to be filled with fibrous tissue; here and there one seemed to feel bone. Some six months afterwards Mr. Rose heard from him and he said his bite was all right. Unfortunately nothing further had been heard of him.

Sir WILLIAM MACCORMAC (being appealed to) said that he had no experience himself of such a method, and could only do what other speakers had done, viz., congratulate Mr. Boyd on the ingenious contrivance. Of course it could not be expected that in every case a bar of steel would remain harmless in the jaw.

Mr. JAMES STOCKEN suggested that platina would probably be preferable to steel.

Mr. C. C. ROBBINS reminded the Society of a case which he brought to their notice some little time back in which a piece of glass had been tolerated in the cheek for thirty-three years, from which he inferred that glass might be a suitable material if properly shaped.

Mr. H. LLOYD WILLIAMS recommended a spanner of pure gold, stating that Dr. Kingsley had used it in some of his operations. He also suggested that ivory might be used.

Mr. G. CUNNINGHAM called attention to the work already done in this direction by the celebrated French surgeon, Professor Ollier, in conjunction with a very skilled dentist, M. Claude Martin, both of Lyons, and to the latter's book, entitled, " De la Prothèse immédiate appliquée a la Résection des Maxillaires " (Libraire-Masson, Paris). The characteristic feature of the operations detailed in it was that the dentist was called into consultation with the surgeon *before* the operation, so that the prosthetic appliance was made before the operation was performed. With regard to the materials most suitable for such appliances, M. Martin's experience was that vulcanite and platinum had given the most satisfactory results.

Mr. STORER BENNETT congratulated Mr. Boyd on the successful termination of his case, if at that time it could be said to be terminated. Mr. Boyd had asked a question as to the most appropriate material for forming a spanner. Without being prepared to offer an opinion on that subject, he (Mr. Bennett) would point out to Mr. Robbins that its brittleness and liability to fracture, would make glass unsuitable. Ivory had also been mentioned, but that would be liable to absorption. He would mention that where lead bullets had been dropped into the pulps of living incisors in wild animals, they had given rise to very little irritation, and the ivory had grown close up to them, but where steel bullets had been used, quite the contrary had been the result, and the bullets had become rusted. Whether some substance like gold or platina would not be more suitable, he thought they had nothing but hypotheses to go upon.

Mr. West thought the great objection to gold and also to platina would be the expense. The objections to a steel bar might be overcome by coating it with lead.

Mr. Sidney Spokes suggested that a vulcanite rod, if properly made, would be thick enough and strong enough ; it would also be non-irritating. It might be used, too, for building up the new part upon if drilled with holes and filled with sterilized sponge.

Mr. J. H. Carter wished to ask Mr. Boyd what he believed had become of the spanner, which, when he searched for, he could not find.

Mr. Stanley Boyd said in reply, that in the first place he thought he guarded himself against expressing any opinion that the case had terminated. He felt confident that the spanner was there, and should not be at all surprised to find it emerging in the region of the chin ; his conviction was strengthened by the belief that the denture alone could not possibly hold the bones in position. The cases which Mr. Newland-Pedley and Mr. Badcock had mentioned—cases of necrosis—were different to his own, inasmuch as he could not hope for new bone, but must depend upon a permanent spanner. With regard to several suggestions as to material, Mr. Storer Bennett had already replied for him, as to the unsuitability of glass or ivory. Platina and gold, of course, would not oxidize. The work Mr. Cunningham had quoted was one that would naturally be referred to, but its size was somewhat forbidding. With reference to vulcanite, it had not such a smooth surface as steel, which had been selected on that account so that the granulation tissue might get as close to the material to which it was to be imbedded as possible. If vulcanite could be as highly polished and would be strong enough, it would be a very good material—perhaps the strength might be obtained by imbedding a steel bar in vulcanite.

Mr. ROUGHTON, F.R.C.S., read notes of a Case of "Removal of an Ivory Exotosis from the Lower Jaw."

Mr. Roughton showed an ivory exostosis, which he had removed from the lower jaw of a young woman. The tumour had been growing for about twelve years ; it was about the size of a small walnut, and was perforated by a canal, through which the mental nerve passed in the recent state. It was removed by sawing it off, on a level with the surface of the jaw. The operation presented no difficulty. The structure of the tumour resembled that of compact bone, but the Haversian systems were more irregular in their arrangement, thus differing from the structure of an odontome.

Mr. FREDERICK EVE quite agreed with Mr. Roughton that it was not at all likely that the exotosis was an odontome, indeed the position of the growth would exclude odontome from the diagnosis. He (Mr. Eve) thought it grew from the periosteum. Mr. Roughton might see in the Museum of the Royal College of Surgeons one as large as a tangerine orange, but he was not aware that any were as hard as odontomes.

Mr. STANLEY BOYD mentioned a little point in the treatment of multiple osteomata of the face ; where they threatened to become large if one cut down and removed the periosteum, the growth would probably be arrested.

Mr. STANLEY BOYD then read another communication.

E. L., aged 22, was admitted into Charing Cross Hospital, under Mr. Boyd's care, complaining of inability to separate her teeth. After the extraction of a tooth, at the age of 7, she suffered from, apparently, extensive necrosis of the left half of the lower jaw ; some external scars remained as evidence, and the left half of the lower jaw was small and ill-developed, as compared with the right. During the progress of this necrosis the jaw became fixed, and no cause other than extension of inflammation from the jaw to the left temporo-maxillary joint could be discovered. Up to the time at which she entered the hospital, she had lived upon fluids and finely divided solids. In addition to the inequality above noted between the two sides of the lower jaw, it was noted that she could separate her teeth about a ¼ inch, and bring them into perfect contact; there seemed to be refer movement in the right than in the left joint. The patient was anæsthetised with gas and ether, the administration of which caused much respiratory difficulty, either increased secretion of mucus and congestive swelling of parts rendered entry of air difficult, or the epiglottis fell back, and the jaw could be neither depressed nor pulled forwards. However, the dyspnœa subsided, and the jaws were separated by screw-gags till the front teeth were about ¾ in. apart. This movement was soon lost in spite of a good deal of perseverance with gags, &c,

About a year later the patient was again admitted and the left condyle was excised through a short vertical wound in front of the tragus. Numerous small vessels were cut, and the parts were a good deal matted, so that it was difficult to recognise parts. But the condyle was ultimately removed with a chisel, mallet and elevator. As the last piece was lifted out there was a free gush of venous blood, probably from a tear in the internal maxillary vein. It was easily stopped by pressure. The jaws were then forcibly separated for about ¾ inch, and the wound was completely closed and a compression dressing applied. The left eye could not be closed for some time after the operation, and the left cheek swelled considerably from hæmorrhage into its substance; but union *per primam* was obtained, and the patient soon left the hospital. Now, after an interval of two years, she was comfortable, and although she could depress the jaw for only half-an-inch she said she could eat quite easily. It must be admitted, nevertheless, that the range of movement resulting from the operation in this case was not as great as could have been desired.

Mr. J. F. Colyer asked if there was any cause for the face being so much larger on that side?

Mr. Stanley Boyd replied that it was due to displacement of the soft parts and non-development of the jaw.

Dr. H. W. Maunsell (late of Dunedin, New Zealand) said that he had operated on two or three cases of a similar nature. On doing so he found the internal pterygoid was extremely tense, and on scraping this muscle away from its attachments the fixation of the jaws disappeared; it was this in his opinion which caused the difficulty, and not any stiffness about the condyle of the lower jaw.

Mr. Stanley Boyd wished to avail himself of the opportunity which his presence afforded, to ask what is the result of opening an alveolar abscess through the face—of course one would never do this if it could be avoided. Mr. Boyd had noticed that in two cases—one from an upper and one from a lower molar—which had been incised through the cheek, a deeply drawn-in scar developed, causing considerable deformity; but in the course of a few months the depression became very much less marked. If this were the usual ultimate result one need not be so much afraid of incising through the cheek in cases where good drainage could not be otherwise established.

Mr. Frederick Eve said that when nature made an opening a sinus usually existed for some weeks before coming under the care of the dentist. Meanwhile, granulation tissue formed, fibrous tissue again contraced and formed a cicatrix round the sinus. He had occasion at the London Hospital to make an opening through the skin, having previously made it through the mouth. He did not observe any depression in that case, but would hunt it up and watch it still further.

Mr. Jas. Stocken mentioned a case which he said was not quite in keeping with those mentioned. The abscess was just opening and on the point of bursting. He painted it with flexile collodion and applied hot poppyhead fomentations in the mouth. The abscess burst and there was no further trouble.

Dr. H. W. Maunsell remarked that he had opened abscesses in the face and did not remember any case in which there was any scar-depression or cicatrix. Of course in most of the cases which had been opened by nature the skin died over the abscess and dropped, leaving a very apparent scar behind.

Dental News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, PASS LIST.

The following gentlemen having passed the necessary examinations have been admitted Licentiates in Dental Surgery:

Name.	Hospital.	Residence.
Barnes, Arthur	Char. X & Dental	Hope Villa, Raymond St., Chester.
Barrett, Fredk. Walter	London & Dental	42 Finsbury Square.
Bascombe, Reginald Ed.	Middlx & National Dental.	33 Sunnyside Road, Ealing, W.
Canton, Herbert (M.R.C.S.E).	Middlx. & Dental	7 Portland Terr., Regent's Park.
Castellote, Bonaventura Alfred.	Middlx. & Dental	16 Belleville Road, Clapham.
Clarence, Thos. Herbert	Char. X & Dental	51 Southampton Row, W.C.
Curtis, Ernest Arthur	Middlx. & Dental	Field View, Blandford, Dorset.
Dodd, Fredk. Lawson	Middlx. & Dental	Grosvenor Lge., Tunb'ge Wells.
Gilmour, William H.	Liverpool & Dental	38 Beaumont Street, Liverpool.
Goodridge, Alan	Char. X & Dental	Sunny Bank, Dartmouth.
Harwood, Edwin Wm.	Char. X & Dental	33 Mortimer Street, W.
Hayward, Savill Henry	Char. X & Dental	12 St. Ann's Terrace, Circus Road, N.W.
Herschell, Ridley	Middlx. & Dental	9 St. Charles Square, W.
Hughes, Geoffrey	Middlx. & Dental	26 Marine Parade, Worthing.
Lingford, John Charles	Manchester	27 Brunswick Terrace, Leeds.
Miller, Ernest Arthur	Middlx. & Dental	8 The Sanctuary, Westminster.
Owen, Wm. Gladstone	Birmingham	14 Highfield Road, Edgbaston.
Pearse, Arthur Samuel	Char. X & Dental	Hope House, Tunbridge Wells.
Phillips, Howard	Char. X & Dental	Worcester Park, Surrey.
Sewill, Joseph Sefton M.R.C.S.E).	L'pool & Guy's	40 Wimpole Street, W.
Smith, Edward Fredk.	Char. X & Dental	176 Brixton Road, S.W.
Spokes, Peter Sidney (M.R.C.S.E.)	Univ. Coll. & National Dental	59 Queen Anne Street, W.
Stoner, Harold Boniface	Guy's	The College, Guy's Hosp. S.E.
Sykes, James Hall	Manchester	Dardsley, Lostock Hall, near Preston, Lancs.
Tanner, Frank Leopold	Manchester	166 Oxford Road, Manchester.
Trott, Fredk, Thomas	Char. X & Dental	Prospect House, Richmond Rd, Exeter.

16 Candidates were referred back to their professional studies.

DENTAL ASSOCIATION OF NEW SOUTH WALES.

Several Dentists in New South Wales have made efforts towards forming a Dental Association on the lines of those existing in Great Britain and in the other colonies. A meeting has been held at which there was a large attendance. Dr.

Alfred Burne being voted to the chair, it was decided to form a "Dental Association of New South Wales," having for its objects "the conservation of the character, status and general welfare of dentists in New South Wales, the soliciting of the Legislature to enact such measures as will best regulate the practice of dentistry in the colony, and to advance and encourage the study of dentistry by such means as may be deemed expedient, and to promote mutual improvement and goodwill." It was agreed that the affairs of the association should be conducted by a board, consisting of a President, two Vice-Presidents, Treasurer, Secretary, and Committee of seven, to be elected at the general annual meeting. A ballot was then taken for the various offices, resulting in Dr. Alfred Burne being unanimously elected president, Messrs. Hodgson and H. Paterson, vice-presidents, Dr. Halstead, treasurer, Mr. H. Taylor, secretary, Drs. A. Hinder, A. E. Lester, C. Marshall, E. R. Mayun, Messrs. H. Peach, S. Chain, and H. G. Low on the committee.

DENTALBA

Precipitated chalk ...	12 oz.	Ammonia (stronger)	1 dr.
Prepared chalk ...	6 ,,	Carmine	1 ,,
Powdered orris ...	6 drs.	Otto of rose ...	12 minims.
Esscnce of vanilla ...	3 ,,	Oil of cloves ...	12 ,,
Tincture of coumarin ...	6 ,,	Glycerine	3 oz,, or a sufficiency.
,, benzoin ...	3 ,,		

[*Note.*—The colour to our mind is too strong, otherwise the preparation is an excellent one.—Ed. *B. J. D. S.*]

VACANCY.

The Dental Hospital of London, Leicester Square. The post of Assistant Dental Surgeon is vacant. Applications to be made on or before the 11th inst., to the Secretary.

APPOINTMENT.

Frank L. Tanner, L.D.S. Eng., has been appointed House Surgeon to the Victoria Dental Hospital of Manchester.

Dental Hospital Reports.

WORK DONE at the Victoria Dental Hospital of Manchester, during the months of April and May, 1892.

	Apr.	May.
Number of Patients attended . .	960	1035
Number of Extractions . . .	755	808
Number of Extractions under Anæsthetics .	113	91
Gold Stoppings	76	77
Other Stoppings	209	216
Miscellaneous	375	220
Crowns	6	4
Irregularities , . . .	18	25
Total	1552	1441

T. E. SHERRATT,
House Surgeon.

REPORT of Cases treated at the Dental Department and School of Dentistry of the General Hospital, Launceston, Tasmania, during the Year 1891.

Extraction of Teeth and Roots . . .	632
Stoppings (various)	104
Removal of Salivary Calculus . . .	23
Irregularities of the Teeth (children) . .	18
Mechanical Appliances, *i.e.*, Regulation Plates, Interdental Splints, &c	5
Miscellaneous Operations	402
Advice and Prescribing Cases . . .	122
Operations under Anæsthetics . . .	50
Total	1356

F. J. DRAKE, M.A., M.B., B.S., *Surgeon Superintendent.*

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AMALGAM.*

By Mr. T. W. Byrne.

Amalgam is generally supposed to have been first introduced and advocated as a filling in Paris in the year 1826, by M. Taveaux. Since the time of its introduction into Europe, it has gone on increasing in its usefulness, with very little outcry against it, till it has attained the position which it holds at the present day, as one of our best tooth saving fillings.

It was introduced into the United States by two advertising men, named Craucour, who amassed great wealth by its use. It was received there (as may well be imagined, gold being at this time almost the only filling used), with anything but a welcome by the better class dentist, who attributed almost every human ailment to its use.

In 1843, rules were passed in the Dental Societies expelling all members who used it; and everything possible was done to prohibit its use.

In spite of all this, 10 years later, a reaction set in. Professor Townsend, the then President of the American Society of Dental Surgeons, gave his sanction to one of the first formulæ of an alloy for making an amalgam. He did this, because he saw that teeth were saved with its use, that could not be saved with gold. He recognized a demerit in its discolouration, and thought that by eliminating the copper, purifying the silver, and by the large addition of tin, he could overcome this difficulty.

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* Read at the Student's Society, Liverpool Dental Hospital, Liverpool, March 1892.

He thus gave to the dental world a much inferior, though a better colour-keeping amalgam.

The alloy, afterwards known as Townsend's, was composed of 5 parts tin, and 4 parts silver.

The metals generally used in making alloys, are: silver, tin, copper, gold, zinc, antimony, platinum and palladium.

Silver, which fuses at 1873 F. heads the list, since it is the most important metal in an alloy used for an amalgam. It gives to it great edge strength, lessens the tendency to contract (if present in the proper proportion), notably maintains the bulk integrity of the filling, and forms, with sulphide of hydrogen with which it is brought more or less in contact in the mouth, sulphide of silver, which, though it discolours both the fillings and the tooth, is highly conducive to its saving.

The next metal used in an alloy, though to a less extent than formerly, is *Tin*. It fuses at 422 F. An amalgam containing from 20 to 50 per cent. of this metal, may be looked upon favourably; its tendency to contraction and loss of edge-strength may be overcome by the use of silver, gold, or copper.

It aids in amalgamation, in producing a better colour, and preventing discolouration, diminishes conductivity, and is the best flux in making an alloy.

Copper fuses at 1996 F. and to it in an alloy are ascribed great tooth saving qualities, a diminishing of the shrinkage, and a quickening of the setting.

Copper is chiefly used in making Sullivan's amalgam, but it is now recognized as being a constituent of any amalgam which lays claim to sub-marine properties.

Amalgams containing copper have the drawback of discolouration, yet to this may be attributed their great tooth saving properties. Mr. Tomes believes it due to the sulphide of copper on the surface of the filling, becoming oxidized into the sulphate, which, being readily soluble, permeates the surrounding structure, where it is again deoxidized into the sulphide.

Gold fuses at 2016, and when used in a small per-centage of from about 2 to 10, is considered a desirable addition ; as it diminishes the shrinkage increases the rapidity of the setting, gives nice edge strength, and helps to maintain a good colour. If, however, it exceeds these limits, it prevents thorough hardening

Zinc which has only been introduced of recent years, is likely to hold its place in the amalgam world. It fuses at 773, and when used from even 1 to 2 per cent. seems to control shrinkage, to add to the whiteness of the filling, and to give the amalgam fine working qualities.

Antimony controls shrinkage and imparts a fine-grained plasticity to an amalgam, but makes it very dirty in mixing and working.

To Platinum is granted the qualities of aiding the setting, and giving hardness after setting. It seems to be a debated question, judging from the opposing views given by different authorities, as to whether it is a desirable addition to an alloy.

Palladium forms with mercury an amalgam which has expanding powers. When undergoing amalgamation, it evolves great heat, sometimes violently exploding.

When metals are mixed together in a molten state we know they are capable of chemically uniting, to form what is called an alloy, which has a melting point and other properties differing from its constituents. Now when mercury and filings are placed together in a mortar and mixed, the same effect is produced; the mercury, being molten, acts on the other metals, and dissolving them, forms an alloy, or as it is called—mercury being a component—an amalgam.

Every alloy requires a certain definite proportion of mercury to get the best admixture and working results; and Dr. Flagg tells us we can only get this by a systematic weighing by proportion.

It will be noticed that in the poorer alloys (those containing a large proportion of tin) we will require a smaller amount of mercury than for the better grade alloys.

The reason for this is, that tin, being easily melted, is replaced by metals which are fused with more difficulty; namely, silver, gold, or copper and which therefore require more mercury to complete fusion.

Preparation of the cavity.—It is well known how much the success of our filling depends on the proper preparation of the cavity. The fact that amalgam has a tendency to bulge and crevice should be borne in mind when shaping. The cavity should always be larger inside, have no sharp angles, and few, if any, retaining pits. The cavity should, in fact, be a concavity.

Dr. Flagg even recommends the retention of all frail overhanging edges to overcome this spheroiding tendency. My own experience, however, has been, that these frail edges chip off, and so give an opportunity for the lodgment of food.

The edges of a cavity should not be levelled off, because it allows a thin overhanging edge of amalgam, which is likely to chip off, and thus produce a ledge in which food will most certainly collect.

Amalgam, being a good conductor of heat, should never be placed in a deep seated cavity, without an intervening layer of nonconducting substance between it and the live pulp.

Insertion of the Fillings.

The methods of insertion are both numerous and varied.

The ones I consider worth advocating are those used by Drs. Flagg and Bonwill.

Dr. Flagg says that each piece should be drawn into position by a succession of taps from a serrated and flat plugger. He says a more perfect filling will be produced by this method, than by burnishing against the walls of the cavity; and states, that, by the latter method, union between the successive pieces is imperfect, and leakage inevitable.

Dr. Bonwill's method is the one I prefer:

Have your amalgam in a medium plasticity, and insert a sufficient quantity. Then by means of a pad of amadou or bibulous paper, press against it, with an instrument, thus driving it home and expelling all superfluous mercury. Treat each piece in succession till the cavity is full.

Mr. Amos Kirby, in a paper before the British Dental Association last year, says, that an amalgam can be made free from shrinkage by filling one third of the cavity with moist amalgam—about half mercury half alloy—and the remainder with dry amalgam, 2 of filings to one of mercury.

The use of a matrix in an interstitial cavity or in building up a tooth is invaluable. I will not weary you by detailing the various ones so well known, but should like to bring before your notice a very simple and valuable one for isolated teeth, for the idea of which I am indebted to Mr. Roberts, our esteemed house surgeon.

This matrix is made from an old clock spring, the temper of which has been removed. Taking a piece of suitable size, we shape it up to the tooth it is required for, and, having done so, again retemper. This matrix is sprung on the tooth to be operated on, and can remain there till the filling had hardened when it can be readily removed by the patient.

A strip of rubber-dam passed over the filling when in a plastic state, will be found to leave a very smooth surface.

A rule should be made of seeing all fillings after they have hardened, as by so doing, we can make sure that there are no overlapping edges, which, when the filling is in a plastic state, it is impossible to see. A filling having once been polished is much more likely to keep its colour.

The changes to which amalgams are liable are: shrinking, bulging and loss of edge-strength. The spheroiding chiefly occurs in those composed largely of tin, and may be attributed to the combined ductility and low melting point of the admixed metals. The shrinkage is thought to be due to the contraction of the metals of the alloy, while passing from the fluid to the solid state. Thus tin losing its fluidity slowly, if present in a large quantity, gives shrinkage, while gold, silver, and copper, losing their fluidity quickly, lessen the shrinkage.

The edge strength of an amalgam is due to the ratio of its components, to their melting points; for example: tin, having little edge strength, and a low fusing point, will have to be mixed in large quantities before it will impair the edge strength of the amalgam, while copper, having fair edge strength, and a high melting point, will seriously impair the edge strength if added in large quantities.

Other metals, especially silver, which has good edge strength and a high melting point, will add to the edge strength of the amalgam. A peculiar property of Sullivan's amalgam is that of disintegrating on the surface. This is not always so; but it occurs often enough to make a serious objection to its use. It remains to be seen, whether an amalgam, containing a small percentage of copper, will keep the tooth-saving properties ascribed to it, without this deteriorating effect. Dr. Flagg tells us he has been using, with the greatest success, an amalgam, containing 60 parts silver, 30 tin, and 5 copper. This amalgam, he says, lasts better than purely copper amalgam, does not stain the tooth so badly, and keeps a better colour.

By the use of amalgam, it is often possible to perform a better operation, reduce the amount of fatigue of the operator and suffering of the patient. Cavities in inconvenient, and sometimes almost inaccessible places, which could not possibly be filled with gold, are better filled with amalgam.

Wisdom teeth as a class are more likely to be saved by the use of amalgam than of any other filling.

Teeth which are loose from any cause whatever are better filled with it.

It may be said to be the only filling which will effectually and permanently save soft or deciduous teeth. Gold, in the teeth of the young, nearly always fails, yet amalgam rarely fails to save these teeth. Roots that we wish to crown, and which are mesially decayed, either mesially or distally may be built up with it; thus affording a better opportunity for fitting the band.

There are certain patients whose weak physical condition will not permit of a long and tedious operation. We should always bear in mind that the achievement of fine operations will not always justify the risk to the patient.

Teeth which either from their structure, position, or surroundings would permit of a good gold filling, should never be filled with amalgam. The discolouration produced by use of amalgam should be sufficient to prevent its use in filling incisor teeth, excepting those perhaps of very dark structure, and in the mouths of unclean patients.

To sum up, amalgam is used by numberless operators. It undoubtedly saves teeth which would be otherwise lost. Though not so artistic as gold, yet, in certain teeth it can be used to better advantage, and although it has not the colour qualities of [the other plastics, yet it lasts and endures attrition so much better, that it is infinitely preferable.

Gentlemen, in conclusion, I recognize the imperfect handling of the subject which ranges over such a vast field, as not to permit me embracing it.

I trust the portion I have treated has been made clear in the preceding pages. I thank you for the earnest attention you have given, and trust the many defects displayed in the paper may be counterbalanced by a good discussion.

IMBECILITY AND ITS CONNECTION WITH ORAL DEFORMITIES.

By W. R. Tuck, L.D.S., Truro.

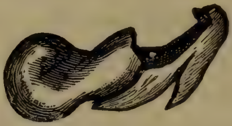
I can scarcely imagine that any practitioner of long experience can have failed to see many malformations of the teeth and oral cavity, or to have observed their connection with Mental Imbecility. Moreover, it may appear strange that these lamentable afflictions have received so little attention from the Faculty, although affording so wide a field for investigation.

The stunted development of the superior maxillary bone, with its high vaulted palate process and everted teeth, standing out at an angle of 45 degrees, its narrowed arch, seldom more than one inch across, invariably denotes a fearful alienation of the intellectual powers, and anyone having the slightest acquaintance with physiognomy may see at a glance by the pinched features, lack-lustre eye, and prominent malar process, that creative power has not been lavished in the formative tissues, and that such an ill-defined, congenital offspring can only linger out a useless existence.

Many cases could be adduced in evidence of the views I now enunciate ; I will now proceed to give one example.

A few years since, a youth about seventeen years of age was brought to me for consultation, the first sight of whom gave me the impression that there was a weakened mental comatus : the dull eye, the shrunken face, the hesitant or jerky speech were unmistakable signs, and conveyed to my mind clearly enough the correctness of the hypothesis now set forth. On examining the mouth, I found the usual high vaulted palate, the narrowed maxillary process, the molars reduced to fragments, and the few remaining front teeth abraded and serrated ; indeed, so far diseased that apparently a slight touch would wreck them entirely. I explained to the father that under the circumstances there was nothing to be done. The youth in question had been placed at school, and on speaking to the principal respecting him some little time afterwards, I was informed that, from his wilful and violent temper, it was impossible to do anything with him in the way of education, and it was decided to request his removal. I heard eventually that the poor fellow had been placed in a lunatic asylum, where, in all probability, he will remain to terminate his days, so fixed and irretrievable was his condition. Whenever we find the natural order of creation so disturbed the penalty is sure to follow. Deviations which are sometimes unseen, preclude diagnosis by insurmountable difficulties, and all converge in mystery unless revealed by some untoward incident.

Another remarkable case, throwing much light on the subject came under my notice a few years ago. A middle-aged woman came to me for advice, complaining that her health was suffering from the loss of several back teeth, which she desired to have replaced by others ; on examination I found two stumps of the second right lower molar, and suggested their removal, explaining that nothing could be made to rest comfortably in place while they remained in the mouth, and endeavoured to quiet her fears by remarking that the operation would be attended with little, if any, pain. I commenced removing them with the elevator, directing the first effort inside ; finding, however, that the stumps did not lift from their resting-place, I then applied my force in an opposite direction, but was met with a similar difficulty. After other repeated and fruitless attempts, I decided on splitting the roots, when I had no further trouble in removing the anterior one. At this juncture, not seeing anything of the wisdom tooth, nor being able to learn it had ever been extracted, I opened the gum freely over the base of the coronoid process, and took away as much as I could of the bony structure over the imaginary crypt, then with a curved elevator applied the blade deeply in the alveolus of the removed root, and after using considerable force, succeeded in dislodging a large mass. I then applied the forceps and brought away the



sequestrum represented in the illustration. In pathological parlance this is clearly osseous union of the teeth. The wisdom tooth which lay horizontally, with the roots turned backward, was united to the second molar, and had exostosis, or an odontome, formed to a considerable extent, causing much of the mechanical obstruction ; this seems a unique specimen, rarely met with. The physical condition of the patient seemed strange, as she declared she felt but little pain during the severe operation. We will now pass over a month or two while the mouth was getting in a fit state for the use of the auxiliary teeth. I was informed shortly after they had been supplied that they conduced greatly to her comfort in every way. A few months elapsed, when I was surprised to hear that she had suffered from attacks of melancholia. It appears everything was done for her in the way of medical care and treatment, but she gradually drifted into a state of imbecility and ultimate dementia, from which she never recovered, and after lingering for years, died a few months since.

I can scarcely refrain from thinking that there may be other malformations in the cranial and facial structures which though occult may exercise powerful influence on the cerebrum or supreme nerve centres.

We may fairly assume that after the œons of ages that have elapsed since the human brain has been in cultivation, it might now be considered as an instrument approximately perfect, capable of receiving and registering impressions, also sending messages as if by telegraphy for the formation, regulation, and guidance of the entire bodily structure, affecting all physically and mentally either for good or for evil ; should, however, the creative power be in some way vitiated by inherited influences, then the constitution so maligned is rendered incapable of co-ordinating perfect parts and functions to the uses originally assigned to them. In this way, every form of disease to which " flesh is heir " may be induced ; moreover, I am quite of opinion that all cranial, as well as other deformities, result from depraved beginnings in the supreme centres. Congenital deformities when externally pronounced, are seen with a saddened eye by those who witness the infant on its first appearance into life ; the usual characteristics are mostly those of hare-lip and cleft-palate, others, however, are not wanting, such as irregularity in the cranial structures, especially the Helix of the ear, which an eminent authority on Lunacy once observed is a true sign of mental imbecility. Anyone with even slender knowledge of Psychological lore may see at a glance the unfortunate intellectual puerility ; it is almost an invariable and life-long concomitant with which these depraved conditions are associated, and with the defects above enumerated, usually begin a long series of troubles, first, the difficulty of the offspring in taking natural pabulum; many others, though quite hidden at this early age, gradually become developed as time wears on ; it is also seen that the limbs move about in a purposeless way not being guided by a spark of intelligence.

In these notes I am of course referring more especially to physical infirmity. We soon perceive that the facial bones are wanting in conformity, the teeth on their first appearance show signs of abrasion and displacement, and malformations of the chest are also noticeable, as in the ricketty diathesis.

Painful as these abnormal appearances are to the parent, they are soon followed by others of a more distressing nature, when it is seen that the mind is inadequate to perform its destined functions, and that all parts of the economy are working out of order. Mind and body are wanting in that synchronism, as put in motion by the breath of life in the more perfect subject.

> "Spiritus intus alit, totamque infusa per artus,
> Mens agitat molem, et magno se corpore miscet."
> *Virgil.*

Many of such cases, now under consideration, come sooner or later to the knowledge of the general practitioner, and give full scope for the study of them, and enable him to exemplify as far as possible the mysterious changes in the infant system. In such cases one can neither take osteological malconstruction nor mental incerptitude *per se*, they must be studied conjointly and when we have advanced so far in that science as to find ourselves enveloped in doubt, here our work must end until increased knowledge has revealed a new way for the investigation of body and mind, always keeping the maxim before us "*Mens sana in corpore sano.*" I may here give a case to illustrate my subject. A young man, about sixteen or seventeen years of age, joined me on one occasion on my travelling down from London; as our domiciles lay in the same direction, and being also well known to each other, time passed more pleasantly while journeying together.

This youthful companion, who was fine, well-proportioned, and of prepossessing appearance, gave me to understand that he was about to enter the medical profession, but some few months afterwards, I heard with surprise, that he had betrayed remarkable aberration of mind, and that whilst uttering a sentence, he would instantly become oblivious, remaining so, for some twenty or thirty seconds, and then, as suddenly, recover, and resume the sequence of a conversation as if nothing had happened. The best medical advice had been obtained, but without avail, for he gradually became worse and epilepsy supervened. At the present time, while the intervals between these attacks get shorter, the severity intensifies, and dementia has resulted.

A short time since, I was asked for an appointment to see this young man; he was brought accordingly, when his attendant told me that he had been suffering acutely in an upper molar. On examination, I advised that the tooth be retained, considering the pain to be of a reflex character.

He was, however, brought again the following day with the complaint that he had not slept all the night, so agonising was the pain. I was ultimately prevailed upon to remove the tooth which offered considerable resistance from its diverging and anchylosed roots: imagine my surprise to find that this patient stood this operation as unmoved as a block of marble, evidently feeling nothing whatever from it.

This remarkable sort of anæsthesia is difficult to define, although it is probable that those who have given more study to such pathological conditions, may be able to do so. I may here remark that there was nothing from the first to portend the lamentable condition now described; yet, on reflection, I recall a vacant look about the eyes which one skilled in optical phenomena would have no difficulty in pronouncing an opinion upon. It was evident that this affliction was latent and easily aroused into activity by scholastic duties.

Powers of Perception in Children.—Binet has pointed out in the *Revue Philosophique*, that at first, children always regard themselves in the third person, and that all their ideas about objects are utilitarian; for example, they look upon a knife as a thing to cut with, bread, as something to be eaten, &c. He experimented upon two little sisters, and found that while between 1 and 2 years of age, they recognized the entire figure of a man, drawn in outline upon paper, it was several years before they could recognize the outline of an individual part, such as an ear or a finger. The first colour to be distinguished, was red. He found it difficult, as may be easily imagined, to come to any conclusions as to how far the ideas of children are spontaneous, or to what extent they represent the recollections of dreams.

British Journal of Dental Science.

LONDON, JULY 15th, 1892.

TRITE TESTIMONIALS.

When a Committee sits to select one candidate out of many for some office, nothing, we imagine, produces more mental wear and tear for a guileless, and would-be impartial, member than the recital of glowing testimonials in favour first of one and then of another aspirant for the post. But whilst our sympathy may be shed in this direction there are others no less to be pitied. If we trace back the testimonial we shall discover that frequently its baneful effects commenced at the moment of its birth, and that there has been a struggle with a good-natured reluctance to refuse, or an honest doubt or disinclination on the part of the writer, whilst as to certain possible results upon a properly modest candidate it is difficult to say whether he most needs condolence when screwing up courage to ask for, or moral support when he first reads, what is written.

The exigences of competition, no doubt, are answerable for the way in which the modern system of testimonials has sprung up, or rather, we should say, has developed. For we cannot help thinking it must be regarded as the refined result of the evolution of the more formal official certificates produced in corroboration of the candidate's claims. It was most probably found, for instance, in hospital appointments that the supposed voluntarily expressed opinion of some distinguished practitioner carried more weight than the regulation "This is to certify" of the Dean of the candidate's School, and as a consequence the multiplication of such opinions was thought necessary even if they only told the same tale in much the same words. However this may be, there are evidences that the method has been carried so far in some directions as to cease to influence any who know the real meaning of these time-honoured biographical statements, and it will be satisfactory, possibly to all parties concerned, to find that, at all events so far as surgical and similar professional appointments are concerned, a reaction sets in and that, as now happens in some cases, "not more than three recent testimonials" will receive attention. This modification at least renders unnecessary the publication of a small volume of perhaps ten times that number, which even if not productive of success in the immediate business in hand, yet constitutes a more or less lasting tribute in print. There are other features not pleasant to dwell upon, and fortunately more rarely displayed, as where the writer makes the well-known statements not so much from good nature as from motives of self-interest and in the hope of sharing in the publicity resulting. We notice that the *Lancet* has recently recorded a protest against some of the extreme absurdities in which the system has resulted, and, after all most people are aware that from time to time cases occur where, even in spite of the "most excellent testimonials," the candidate presenting them has been beaten by a man who perhaps sends one or two, merely as a matter of form, but who is well-known to the electorate to be sufficiently suitable for the position. In this case the testimony in favour of the distinguished stranger is also regarded as a matter of form and it is recognized that the still more distinguished men who have so testified will not feel insulted, or show any marked resentment that their opinions, so eloquently expressed, have been deliberately ignored. The fact is that this bold, and in some cases fulsome, praising has become so much a matter of routine as to cease to have a distinct value even if it does not actually recoil, to the detriment of the candidate, but until some other system (perhaps in the form of an official record) of imparting necessary knowledge, takes its place we shall still have to face the existence of certain monotonous productions of good-natured individuals, which contribute nothing of real value in determining the actual worth of rival candidates, unless it is, perhaps, by furnishing a contrast to the fewer examples of genuine merit.

"CURES" FOR INEBRIETY.—At a meeting of the Society for the Study of Inebriety, the President, Dr. Norman Kerr, in his address dealt with the attempt to float a syndicate to raise £150,000 in order to purchase the right of using in England a secret "cure" named the "double chloride of gold cure." There are twenty-six branches in America for the sale of this remedy and the pair of bottles containing it costs 36 shillings. Dr. Usher, of Melbourne, next described his visit to a sanatorium where he saw rows of men being injected in the left arm with five drops out of a little porcelain bowl containing pinkish liquid, and he appears to have come to the conclusion that atropine was employed. Seventy per cent. of the patients had glasses and some told him they became blind for weeks together. About £40,000 a year was spent in advertising the concern which was now engineered by some of the "smartest" men in America. Many cases of failure and death were quoted to the meeting, and the following resolution was agreed to unanimously:—"That this meeting, having been informed by a competent London analyst, who has made a special analysis, that the alleged 'bichloride of gold cure' shows no trace of gold or of chlorides and contains 27·55 per cent. of alcohol, condemns unreservedly the prescription of such an intoxicating preparation to an inebriate."

CHLORAL FOR TOOTHACHE.—In discussing an inquest on the death of a child two years of age, the *British Medical Journal* says that the smallest fatal dose of chloral it knows of, is three grains which killed a child one year old. In the present case, a solution of chloral had been prescribed for an older child for toothache, and the two-year old infant helped itself to a dose of about a drachm, and died some hours later, after tracheotomy had been performed. The medical witness called, seems to have expressed an opinion against treating toothache by means of chloral, and, as we think, very wisely, but the *British Medical Journal* knows of no valid objection to such a line of treatment. It is, of course, possible that complications might exist, to prevent the necessary operative treatment at the time, but we feel bound to offer a protest against the routine treatment of ordinary toothache by securing palliation by the internal administration of drugs, and a knowledge of the pathology of the dental pulp would warrant a still stronger statement.

LIME IN THE SALIVA.—Dr. Lepkowsky has been making observations upon this subject, with a view of explaining the variations found to exist. Perfectly normal saliva contained from 2 to 3 per cent. of lime, but the amount depended upon the period when it was secreted ; there was an increase a few hours after a meal, as well as when there was a rise of body temperature. In cases where there was any caries present even if in only one tooth, the proportion of lime increased from three to five per cent., and was still larger, from six to nine per cent., in people who had become edentulous. As to the cause for the variation, it is suggested that nervous influences have probably much to do with it, and the idea that it is dissolved from the teeth, is untenable.

MASTICATION AND CEREBRAL CIRCULATION.—Dr. Lauder Brunton has recently pointed out, that the stimulation of some branch of the fifth nerve appears to increase the circulation in the brain, and that those who make exceptional calls upon their mental powers are accustomed to utilise this fact. No doubt it would partly depend upon the kind of stimulus employed, as to what sort of mental re-action would be displayed. No one, we imagine, would resort to securing an exposure of the pulp in a carious tooth, and it would be better to experiment in the direction found successful by the late Lord Derby, and send a message, *via* the gustatory branch, by eating brandied cherries. A tracing of an experiment of Marey's also shows that mastication accelerates the flow of blood through the carotid, and leads Dr. Lauder-Brunton to quote another case where an editor was in the habit of eating figs while writing his leading article. Other interesting instances mentioned are, the scratching of the head by a suddenly questioned rustic, and the stroking of moustache or beard, adopted by more cultured men, in order to stimulate cutaneous branches. Dr. Lauder-Brunton has elsewhere recorded the possible effects of a good dinner, but the present suggestions enable one to realize how the masticatory and gustatory nerves may lead to a development of loquacity at the festive board, even without the presence of alcohol in the blood-stream, and how a mild form of pseudo-intoxication may result from a due appreciation of the "liver-wing."

CAMPHOID.—If a solution of camphor is made with an equal quantity, by weight, of dilute alcohol, it will dissolve iodoform in the proportion of one in ten. In order to fix such an application to the part to which it is applied, Mr. Martindale added one part of pyroxylin, to forty parts of the solution, and found it would act as a substitute for collodion. The preparation dries in a few minutes, and forms an elastic film which does not wash off, whilst the excess of camphor, which seems to volatilize, disguises the odour of the iodoform. Other medicaments, such as carbolic acid, salicylic acid, resorcin, and iodine, can be used in the pyroxylin solution, for which Mr. Martindale suggests the name, "Camphoid."

Fracture of the Upper Jaw, with Malar Depression.—Mr. George Wherry, the University Lecturer in Surgery at Cambridge, draws attention in the *Lancet*, to the ease with which this condition is overlooked, and narrates the case of an undergraduate, who, five weeks previously, had been knocked down at a football match, and after some symptoms of concussion of the brain, apparently recovered. On examination, there was a very evident line of fracture to be felt on placing the finger inside the cheek on the malar process of the superior maxilla. Besides a slight depression of the left malar prominence, an irregular chink was to be felt along the orbital margin, and mastication had been impossible on that side since the accident. There was also a remarkable gap, which prevented the articulation of the first molar with the lower teeth, which, however, Mr. Wherry considers, may be only a coincidence.

In some cases, there is no more shock or bruising than is usual in an ordinary black eye; others may be marked by orbital abscess, paralysis of the infra-orbital nerve, or serious head symptoms, so that in every case where there has been a blow upon the malar prominence, an examination should be made of the orbital ridge, the malar process of the upper jaw, and of the zygomatic arch. The finger passed up beneath the cheek will readily detect any fracture of the malar process.

The Cholerine Epidemic in Paris.—Bacteriological researches, conducted by M. Netter, have led to the discovery in a fatal case, of a bacillus in the intestines, very much like the micro-organism of true cholera. The Hygienic authorities, who have investigated the matter, regard the Seine water as the cause of the outbreak, and recommend that it should be boiled previously to being supplied to such customers as are condemned to the ordeal of using it. The special correspondent of the *Lancet*, complains that although investigations upon the dejections of the patients have been carried out, the official report has not yet appeared. He ascertained from private sources, that the cholera bacillus had been found but was also told that such germs were always found in cases of cholera nostras, and that it would be necessary to cultivate them, in order to distinguish them from the true Asiatic cholera germ. This has been done, and as nothing is published on the subject, the correspondent concludes that probably the result is not encouraging. It seems that the official report on the epidemic, drawn up by Dr. Proust, was actually in print, and about to appear in the *Official Journal*, but was suppressed by order of the Prefect of the Seine. According to what we have read on the subject, visitors to Paris should stay in the city, and avoid the suburbs where no water, except that from the Seine, is available.

PRIZE DISTRIBUTION, DENTAL HOSPITAL OF LONDON.—A very large number of friends and visitors assembled at Prince's Hall, on the 13th inst. The Dean, Mr. Morton Smale, read a very favourable and satisfactory report dealing with the events of the year. In it reference was made to the new medical curriculum, and a hope expressed that the extra year now required might, in the case of dental students who take the conjoint diplomas, be spent at a dental hospital. Prof. St. Geo. Mivart presented the prizes and certificates, and after a comprehensive address of some length, the rest of the evening was agreeably spent in music and recitations, or the inspection of portraits and refreshments. There would seem to have been a very keen competition amongst the students for the prizes, and in one case Sir Edwin Saunders presented, in consequence, an additional prize. We regret it is too near our day of publication to give a full list in the present number of the *Journal*.

Abstracts of British & Foreign Journals.

TWO CASES OF REMOVAL OF THE GASSERIAN GANGLION THROUGH THE FLOOR OF THE SKULL FOR TRIFACIAL NEURALGIA.

By Edmund Andrews, M.D., Chicago.

Case I. This patient was a woman about sixty years of age. Her neuralgia came on five years ago, beginning mildly and gradually increasing in severity. The inferior maxillary nerve was the one affected, and the least touch on the cheek, and every effort at swallowing, caused horrible paroxysms of pain. Owing to the distress caused by swallowing she had long ago given up taking solid food, and grown so weak that for the last five months she had been confined to bed.

I etherized the patient and proceeded as follows, making the external incisions after the plan of Rose, but operating on the deeper parts by a method of my own.

A horizontal incision was made along the zygomatic arch, and crossed by two vertical incisions, one at each end. The arch was sawed off at each extremity and turned down upon the cheek, carrying with it the masseter muscle which arises from it. This uncovered the temporal muscle and its insertion into the coronoid process of the lower jaw. I then sawed off the coronoid process and turned it upward, carrying with it the temporal muscle. Beneath lay some loose fat, containing the superior maxillary artery and the dental and gustatory branches of the affected nerve.

Tying the artery, I found the two branches of the nerve, cut them off and seized the stumps with strong forceps, and used them as a guide to the foramen ovale, through which their common trunk emerges from the cranium. I then cleared away the tissues from the level area of the cranial floor which lies just external to the foramen ovale, and applied a trephine with a long shaft to the area mentioned, setting its edge about two millimeters from the foramen. The button of bone being removed the dura mater was brought to view. The septum between the edge of the trephine hole and the foramen was then removed with bone forceps. The nerve was drawn outward and the inner half of the wall of the foramen nipped away. Taking the nerve as a guide I then opened the capsule of the ganglion and scooped it out with a small sharp surgical spoon. The temporal flap was then laid down and the coronoid process fastened to the jaw with silver wire. Next the masseter flap was brought upward and the zygomatic arch wired to its place in a similar manner, and finally the incisions in the skin were closed by silk sutures, a small point being reserved for drainage.

The wound healed mainly by first intention. The neuralgia ceased at once. The entire area of the distribution of the nerves derived from the ganglion was deprived of sensibility. A peculiarity was that the third and fourth nerves, which control the recti muscles, were paralyzed, so that the patient could not move the globe nor lift the upper lid, showing that these nerves were injured by the instruments while enucleating the ganglion, owing to their close proximity to it. However, the nerves were not destroyed, for at the end of four weeks the patient had completely recovered the lost motions, but not the sensibility of the organ.

The pain of swallowing having been abolished, the patient began to eat heartily, recovered strength and resumed personal care of her household. Three months have now elapsed with no return of the pain, and it is to be hoped the cure will be permanent.

Case 2. This patient was a woman, sixty-five years of age, and in much the same condition as the other. A year previously I had trephined the ramus of the jaw and resected the dental nerve on the proximal side of the ramus of the jaw. The pain stopped for three months and then relapsed. I therefore decided to remove the ganglion and operated by the same method as in Case No. 1. The dental branch of the nerve having been removed at my previous operation, I was deprived of the use of its trunk as a guide to the foramen ovale. However, I found easily the free edge of the external pterygoid plate, and tracing it upwards to its junction with the floor of the cranium, I found the foramen, and passed a probe into it. The rest of the operation was the same as in Case No. 1. The pain was at once relieved and there was no paralysis of the muscle of the eye.

Four weeks have elapsed, and there is thus far no return of the pain.

There has not been time since my operations, or those of Prof. Rose, to settle the question of permanency. However, I think it in the highest degree probable that in almost all cases the progressive neuritis causing the pain ceases when it reaches the ganglion and rarely extends onward to the brain, just as it usually does in the ganglia of the intercostal nerves in herpes zoster; and if this be ultimately found to be true, then this operation will permanently cure the great majority of cases.—*Chicago Medical Recorder.*

THE THREE MEDICAL SCOURGES OF MANKIND, COCAINE, MORPHIA, ALCOHOL.

Editorial in *Pacific Record.*

ALTHOUGH as yet less advanced in its conquering march, cocaine is proving a formidable rival to its two older brothers, extending its ravages especially to professional men, and all efforts hitherto made to combat it have remained as unsuccessful as the efforts against alcohol and morphia. To the physician anxious to do his duty there is nothing left but to explain to all his clients or patients the terrible consequences of the two new medical scourges—those of alcohol being sufficiently known—as long as there is any prospect of counteracting from the very first the powerful tendency of our days toward artificial stimulation by persuasion and warning. Failing in this, he should apply all his energies to a rational treatment for the permanent suppression of incipient morphinism and cocainism. We give here a few views on the action and mode of treatment of the two affections, as suggested by recent experience:

MORPHINISM.—The habitual use of morphia injures principally the higher intellectual functions, and especially debilitates the energy of volition. The tendency is to increase gradually the doses, until at last nutrition and the trophic action of the brain is impaired and a disturbance of appetite and all other nervous functions follows, natural sleep itself being finally rendered impossible. The craving for such excessive application of morphia is of a most persistent and obstinate nature which it is difficult to resist; there is no remission nor periodicity in it. The nervous constitution of the patient is of material importance in acquiring the habit. In the majority of cases, the beginning is made by introducing the remedy on account of disturbed sleep or for the removal of pain. As to the therapeutic methods, rapid and absolute suppression of the remedy is generally recommended, although some practitioners are rather in favour of gradual weaning for the purpose of avoiding the intense suffering entailed on the patient by sudden privation. Bromide salts and wine, meat, peptones and generally a strengthening nutrition, as far as the stomach and intestine will support them, should accompany the treatment. Bismuth, ice, cutaneous excitents may be prescribed as sedative against stomach-ache and vomiting; the action of the heart will be strengthened and regulated by application of digitalis and strophanthus. Sleep may be induced in the first night, but not too long, by the use of paraldehyd and sulphonal. In the case of considerable emaciation massage should be applied.

COCAINISM.—Cocaine is the most rapid and most powerful of all known remedies for the annihilation of free volition and of moral sentiment. The morbid desire is very intense and not easy to be moderated. For the purpose of obtaining a constant effect of the remedy, the dose has to be increased in more rapid progression than with any other substance. Delirium and hallucinations of the senses become chronic in cocainism. Its immediate manifestations are of a more transient nature than in other agents of the same class, but this does not refer to the case of typical habit. Therapeutic treatment of cocainism should consist in immediate suppression of cocaine; careful watching of the patient who in the beginning shows strong suicidal disposition; administration of all kinds of aliments apt to strengthen the patient; application of bromide of ammonia in conjunction with wine, cognac, tea and coffee; the prescription of paraldehyd and sulphonal for the first nights of treatment.

The characteristic symptoms of morphinism are known well enough. Cocainism, being of more recent origin, has not been studied in all the phenomena to which it gives rise, with the same degree of exactitude. A German author of considerable experience thinks the following is a good clinical picture of cocainism: On the one side there is cachexia or bodily ruin, on the other side there is moral impairment and pronounced mental affection. Patients who use cocaine alone—and those who have endeavoured to wean themselves from morphia by its aid, and so added cocainism to the morphia habit—appear marasmatic. The skin is of a pale yellowish, almost cadaveric tint, and withered feel; the extremities are cool and covered with cold sweat. The eyes are deeply sunken, glistening and surrounded by a dark ring; the pupils widely dilated. Appetite is lost; digestion disturbed. Salivation with dryness of throat may be complained of, and further, partial sensory disturbances or total analgesia. From the paralyzing action of cocaine upon the blood-vessels, patients complain of palpitation and breathlessness, troublesome sweating and noises in the ears, and also syncopal attacks and dyspnœa. The pulse is more frequent and easily compressible. They suffer from a want which must be satisfied; they become nervous, trembling, and fall into a wretched condition of neurasthenia. Speech is disconnected and can scarcely be understood; impotence and incontinence of urine may appear. Sleeplessness sets in early. One of the most characteristic effects of this habit is the occurrence of muscular twitching, tonic and clonic convulsions, and finally epileptic attacks in which the patient may die. The mental symptoms may take the form of hallucinations, usually of general sensation, but not infrequently of sight as well. General mental weakness may set in rather early, to be observed in a loss of memory and unusual prolixity in conversation and correspondence. When the drug is withdrawn, besides the vasomotor symptoms there may be seen depression, impairment of will power, weeping, etc. The chronic form does not protect from acute intoxication.

Southern Dental Journal.

THE EPIDEMIC OF QUACKERY.

By George M. Gould, M.D.

The physicians of the civilized world are to-day working for the public welfare with a zeal and intelligence, combined with an unselfishness that no other profession, trade, or calling can faintly rival. Think, first, that these men are almost furiously seeking by hygiene and prophylaxis to render their own calling useless and superfluous, themselves occupationless.

That is a fact so strange as almost to seem unnatural in these days of self-seeking, class legislation, trusts, and combines.

Notice, again, that every instrument, discovery, drug, or invention, brought out that will do any good to humanity, is at once and unreservedly given to the world. No physician ever patents or keeps secret any discovery or invention. Compare that with the world's way.

Reflect, thirdly, that all the world over every physician, whenever asked, gives his services to the poor without demand or without hope of compensation. Would not a lawyer, or a locksmith, think one crazy if it were proposed that he should give a large share of his time and service for nothing?

Carry the thought on. The entire tremendous labour, *for the benefit of the community*, of keeping up the enormous hospital work of all the world's cities, is borne by physicians without pay. Are there, for example, thousands of similar institutions where the poor, free of charge, can get legal counsel and help? Is there one such?

In has been the universal medical tradition, accepted without a murmur, that whosoever devotes himself to the healing art must gladly construe his duty in this unselfish manner, renouncing the usual ideals and commercial methods of the surrounding world. Beyond all question it is a fact that a like grade of intellectual capacity, the same educational preparation, and an equal amount of tireless labour in any other calling would yield a far greater financial result than is secured by the average physician. A great physician said, "If my son goes into the medical profession, I shall cut him off with a shilling." "Why so?" "Because the profession is not appreciated by the public."

It is a public misfortune, a social evil, if there is slowly, subtly, but most certainly, creeping through the profession the lethal poison of a lowered ethical standard. Every person of the land has a selfish interest in preventing our adoption of the more selfish aims and ideals of the world of trade. Business men are very short-sighted if they allow or encourage medicine to become a business. Whenever this change shall have come about (if, alas! it should), and medical success is sought by the prevalent rules of trade, then the degradation will be irreparable, one of the noblest of offices will have become as corrupted and salable as those of politics, and an engine of incalculable good to humanity will have been hopelessly wrecked.

Could one but reach their ears, how one would like to appeal, to the general public, to legislators of a serious-minded type, if such there be, to the better class of independent journals, to the more thoughtful of literary men, to the rulers and teachers in colleges and universities, to careful and prudent business men even, to patriots and lovers of humanity, all. This malicious and stupid misconception; this non-recognition of, and opposition to, the true work and worth of modern scientific medicine; this hectoring and bullying of physicians in all their aims for the public good, this cordial support of all legislative and sordid schemes of cranks and quacks—is a social menace and a common danger. It is long past the time that this suicidal debauchery should have been stopped. To all good citizens it should be protested: This is your affair, not ours.

The Medical News.

PYORRHŒA ALVEOLARIS.

By H. W. Bovee.

The author was somewhat confused when he examined the literature of this subject, owing to the misapplication of this term to diseases of the mouth. Although the meaning of the term indicates a flow of pus from the sockets, it is now becoming understood to refer to a loosening of the teeth, not necessarily accompanied by such a discharge, and the term has been applied to cover all the diseases of the peridental membrane which have their origin at the margin of the gums. Indeed, the author, himself, thinks that some of the classifications of the affections of the gums and teeth merely represent the different stages in what comes to be, eventually, pyorrhœa alveolaris. He refers the two opposite views as to causation; one that the disease is constitutional—a lack of proper nourishment, with lowered vitality of the parts; the other that it is not only local, but due to local causes. The author thinks both conditions are prominent factors in many cases, and that everything which tends to produce abnormal conditions at the neck of the tooth, or a degenerative disturbance in the socket, may be considered a cause. For instance, chronic inflammation of the root membrane might be aggravated by constitutional causes, whilst the list of local causes is, necessarily, a long one. The disease is slow in progress, there is an uncomfortable feeling about the tooth, but, usually, no positive pain, and generally the disease extends to other teeth. There are at least four prominent symptoms which aid in the diagnosis, viz. :—loosening of the teeth, recession of the gums, a soft, tumified gum which readily bleeds, and has a dark purple colour, and the fourth symptom would be a bad breath and disagreeable taste. All these occur simultaneously, or any two may exist without the third. The discharge of pus may be only a probable incident, manifesting itself in the later stages, for the disease may be making rapid progress before pus is discovered.

With regard to treatment, all tartar must be removed, which may require several sittings, and also serve to arouse in the mind of the patient, an active determination to keep the teeth clean in future. If there is a flow of pus, peroxide of hydrogen, in which has been dissolved one grain of bichloride of mercury to the ounce, should be applied with a syringe. If the vitality of the tissues be low, a twenty to thirty per cent. solution of zinc chloride may be used in the same way. If the alveoli are so far gone as not to hold the teeth with firmness, extraction is the best remedy, though mechanical treatment has been tried. Binding wire and silk ligatures are not only unsightly, but difficult to keep clean.

Dental Journal.

CONTOUR FILLINGS—WHAT THEY SHOULD BE.

By Geo. H. Cushing, M.D., D.D.S., Chicago.

The preservation of the teeth and securing the greatest degree of usefulness of these organs for the longest possible period, being the object in operative treatment, it only remains to consider what influence contour may have for or against the accomplishment of this end. It may be laid down as the absolute rule that the contour of all fillings which will be subjected to great strain, should be such as to most fully protect them from any force of impact that would tend to dislodge them or to drive them away from the walls of the cavity. This rule, of course, only applies after the restoration of such natural contour as may be essential for hygienic or æsthetic reasons, and may be more profitably followed in the case of proximal and crown surfaces in molars and bicuspids. In these cases, where the decay extends below the point of natural contact of the proximal sides, it is essential to reproduce the natural contour, to such an extent that the fillings may, when finished, touch again at the same point. This is necessary in order to preserve the interproximal space toward the necks of the teeth and also to prevent food from crowding between the teeth and upon the gums, where it sometimes causes serious disturbance. Beyond this point a restoration of natural contour is rarely if ever to be tolerated. From the point at which restoration of the natural contour on the proximal sides ceases to be essential up to the termination of the filling in the crown, the surface should gradually slope, or, to reverse the statement, the surface of the filling should slope downward from its most remote edge, either mesially or distally, as the case may be, to the point at which it is desirable to commence the restoration of the original contour on the proximal surfaces.

The anchorage of such fillings should be made as strong as possible without weakening the tooth. There should be if possible a strong square base at the cervical portion of the tooth, a firm seat—that shall be at a right angle with a perpendicular line drawn on the proximal surface, and the walls should be made as nearly parallel as possible. Unless the walls are extremely thick and the dentine very firm it is better not to make any undercuts or grooves, but to rely entirely upon the proper seat and thorough anchorage in the crown. If they are thin or the dentine of poor quality, grooves and undercuts must not be made. If the square seat cannot be obtained, as large retaining pits should be drilled as can be done without endangering the pulp. Of course this is only a general rule, and subject to such modifications as the peculiarity of individual cases may render necessary.

Where such shapes as have been described are given to fillings of this character the force of impact tends to slide over the surface and not to drive the filling away from its seat. If on the contrary the filling is built up so that its grinding surface presents a horizontal plane even, the force of mastication will tend constantly to drive it outward from the centre of the tooth. If the restoration of the original contour is carried still further, and the marginal ridge is raised in the normal form, the strain upon the filling will be much greater and its value correspondingly impaired. Now in many cases, where the cusps of the natural teeth which antagonize the gold filling are very long, it is necessary to grind them off. as well as to shape the surfaces of the fillings as above described. Without thus grinding off the cusps, it would in some instances be impossible to get sufficient thickness of gold to ensure any stability of the filling. It will undoubtedly be thought and urged by some, that such extreme precautions are not necessary, if cohesive gold is solidly built up as it can be from secure anchorage made at all possible points. Such a defence of the restoring the natural contour in situations that have been considered, can only come from a want of knowledge of the materials we have to deal with, and the principles upon which our operations are based.

A grave error that many operators fall into, is the belief that gold can be so thoroughly impacted into strong tooth structure as never to be disturbed or displaced except after a recurrence of decay. Such a belief ignores the fact that the ability to resist mechanical force has a limit, and when the force exceeds that point something must give way. The great malleability of gold renders it impossible for it to sustain through a series of years the constant impacts imparted in the act of mastication, without eventually being drawn away from its bearings upon the edges of the cavity, and even were it less malleable and did it not yield to the force of impact at all, the structure of the tooth would eventually give way to the incessant pounding to which the filling would be subjected.

The cases thus far considered are the most important, and the ones most likely to fail from improper contouring, but there are others where the observance of this same principal will prove of great value, though it be carried out only to a limited degree.

In the building down of incisors where a considerable portion of the labial wall has been lost, it is desirable to slightly slope the cutting edge of the filling from its most distant mesial or distal proximal corner up to the point of contact with the tooth. This would unquestionably lengthen the term of usefulness of such fillings as compared with those that were absolutely restored to their original contour. In all such restorations—sharp corners should always be slightly rounded.

With regard to the anchorage of such fillings—the same rule holds good as given before.

There is one other situation in which the restoration of natural contour would be undesirable, and that is in proximal fillings in the superior incisors, where the palatal angle of the filling should be cut away so as to leave a self-cleansing surface.

The Dental Review.

DENTAL HINTS.

By Geo. M. Merritt, Jersey City, N.J.

In separating teeth, or cutting down fillings with sand-paper disks, first run both sides against a piece of dry soap. You will be surprised and pleased to see how nicely they will go between the teeth, and how much better they will cut the gold.

Sand-paper and emery strips treated in the same way will cut better; and never catch or tear the dam. It is also more pleasant for the patient.

In closing flasks, either by simple pressure or by boiling, use rubber dam wet with soap water instead of muslin, and you will be delighted with the result.

Broken cone-socket excavators make the very best plugger points for the Snow and Lewis automatic pluggers. They just fit, and the newly fractured points are better than serrations.

An infallible and simple remedy for dark joints: After the case is flasked, open and remove all traces of wax, put a drop of water on the joint, and with a quill toothpick work in a little dry plaster; after standing ten minutes pack and vulcanize. If properly done you cannot have a dark joint if you want one.

Items of Interest.

PRACTICAL NOTES.

By DAN. MCPHEE, L.D.S., Arnprior, Ont.

☞ Dentists who are in the habit of using an articulation, will find it advantageous when making an upper plate on rubber (full or partial), to take an impression of the under teeth also. When this is done, insert the model jointly into the occlusion left by the under teeth in trial bite, then put the case into the articulator. In this manner bubbles will be avoided, and there will be less danger of breaking the plaster is run into the bite.

For an easy and safe method of extracting the roots of the right inferior molars, use a pair of upper bayonet alveolar root forceps, and stand at the left and front of the patient. In this position the operator is not apt to strike the forceps against the upper teeth, either by a sudden break or removal.

For filling children's teeth, of the second dentition, use the best plastics, or other good preparations of a similar nature, until the patients have arrived at the age of seventeen. These plastic fillings harden and strengthen the tooth while developing, and when they are properly put in, they will arrest further decay. Of course, teeth temporarily filled should be recapped when necessary, until the patient is a proper age for either gold or amalgam fillings. The cavity may in nearly every instance be prepared with sharp and well adapted excavators, and thus the child will be relieved of the horrors of the "boring machine."

When there are any doubts about permanently filling a treated tooth, try dipping a pledget of cotton in a plastic filling mixture (liquid and powder) and fill the cavity for a time. It hardens and excludes moisture and can be readily removed. The cavity must in all cases be thoroughly dry preparatory to the insertion.

Dominion Dental Journal.

ARTIFICIAL TEETH FROM A HYGIENIC POINT OF VIEW.

IT is common experience amongst dentists that a very large majority of artificial dentures worn are discoloured and by no means devoid of unpleasant odour. This lack of cleanliness which arises sometimes from neglect, but often from want of instruction on the part of the dentist as to the necessary *modus operandi* is a fruitful cause of inflammatory conditions. Debris of food mixed with saliva and mucus accumulating on a plate rapidly undergo decomposition, with the result of irritating the mucous membrane and producing a general inflammation of the oral cavity. The oral secretions become altered and vitiated, so as to cause dyspepsia, and caries of the remaining natural teeth is set up which proceeds with great rapidity, especially in the "clasp" dentures, not from the friction, but because the inside of the clasps most generally escape the brush. The materials used in the construction of artificial dentures differ widely in their effect upon the tissues with which they come in contact. A larger number of cases of inflammation of the oral tissues occur where vulcanite is used as a basis than with gold or other metals, and so prevalent is this inflammation in the case of vulcanite that it has received the distinctive appellation of "rubber sore-mouth." Several reasons have been assigned for the effects produced by vulcanite. Nearly all this material is coloured with mercuric sulphide (vermilion), which ingredient has been accused of being the cause of trouble; but an exhaustive investigation did not substantiate this view, one particular point being that "rubber sore-mouth" often occurred where black-rubber was used, which contains no vermilion. The porosity of vulcanite, especially when not sufficiently vulcanised renders it liable to retain deleterious material if not kept scrupulously clean.

Lancet.

Selection.

TOOTH CULTURE.*

By Sir James Crichton-Browne, M.D.
Lord Chancellor's Visitor.

Gentlemen,—

It is with unaffected diffidence and in compliance with the pressing solicitations of a valued, if somewhat exacting, friend that I occupy the chair this afternoon and presume to preside over a meeting of a body of men at whose feet I should sit for edification in the subjects that are to be considered here. But whatever I may lack in knowledge of the topics which are to engage your attention, I am not behind you in lively interest in them, for since I read the paper of Mr. J. Smith Turner, on the Condition of the Teeth of School Children, communicated to the Hygienic Congress in London, I have realized the importance of the inquiry which he described and have sought further information bearing on it. Some special investigations which I have myself undertaken from time to time into our present educational systems in their physiological aspects have prepared me for the disclosures which you are making, and I need scarcely say that I fully accept the conclusions arrived at in your first collective report, and am in complete sympathy with you in the recommendations offered in that report, and during the discussions of your Association which have taken place upon it. That report is, it seems, to me, a very grave and significant document, revealing a state of matters for which even those most familiar with dental defects were scarcely prepared, for it is surely startling to find that amongst 5249 children under twelve years of age, there are only 485 with normal or perfect dentures—that is to say, made up of sound teeth requiring neither filling nor extraction, that only 26 per cent. of infants at five years of age have teeth free from caries, and that every 1000 children at twelve years of age have amongst them 2543 teeth affected by caries. Almost as startling as the report itself are some of the statements of independent observers by which it is supported, such as that of Dr. John Livey, who, after examining the teeth of 4000 children attending schools in Bolton, said that during the course of this enquiry he could not help observing that caries is extremely common and that indeed it is quite the exception to find a perfect set of teeth, more especially in children over ten years of age; such as that of the dental officer to the Police Orphanage at Twickenham, who said that not more than one child in three enters the Orphanage with sound teeth; such as that of Mr. Fisher of Dundee, who said that amongst 400 boys on the training ship *Mars* in the Firth of Tay, drawn from a part of the country where bone and muscle are of the best description, boys who are kept clean, well housed, clothed and dieted, he found only 80 sound sets of teeth; or such as that of Dr. Cunningham, that in a school at Hull there were 595 defective teeth for each

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*An Address delivered at Cambridge on June 22nd, 1892.

100 children. The fact that 10,000,000 of artificial teeth are used in this country annually, although, of course, only a small proportion of the population can procure these articles of luxury, brings home to us the truth that dental mortality is heavy in these days and that the gaps in dental circles that require filling must be big and numerous.

Putting aside for the present the important information you have supplied regarding other dental abnormalities and diseases found in school children, supernumerary teeth, honeycombed teeth, syphilitic teeth, fractured teeth, enamel defects and fistulæ, I wish to confine what I have to say this afternoon to caries, the most ruinous of dental maladies, not only in children, but at every epoch of life ; and if in speaking of it I should utter what are to you truisms or travel over ground with which you have long been familiar, I must crave your kind indulgence, which I am sure you will extend to me when you remember that my acquaintaince with the literature of your specialty is necessarily limited. Even the crudities and and impertinencies of an outsider, however are not without instruction to the expert and from my stumbling steps you may perchance gather some hints to expedite your own advance.

Now, as regards dental caries, it can be scarcely necessary that I should rehearse to you the evidence that has been adduced to prove that it is now far more prevalent in this country than it has ever hitherto been and that its ravages are more widespread and serious, in the present than in any former generation, about the dental history of which we have records. You will probably agree with me that that evidence is conclusive and, indeed, I take it that your own observations on the condition of the teeth of school children make it certain that dental degeneration has now attained an ascendency that it did not in former times possess. It is impossible to believe that the British Empire would have become what it is to-day if amongst those hardy Norsemen who pushed up their keels upon the shore at Ebbsfleet and entered upon the making of England, there had been only one sound set of teeth in every ten, or if amongst our ancestors, who have extended our dominions by land and sea, and won for us our civil and religious liberties by struggles in which personal vigour and endurance counted for more than they do in the highly scientific and explosive warfare of modern times, there had been all but universal rottenness of the teeth before adolescence. Depend upon it, that in the England of the past the teeth were not as frail or troublesome as they are to-day. The skulls dug up on the battle-fields of England grimly and silently attest the fact, and the very existence of your profession in its present magnitude in the country bears witness to it. I am not going to argue that the sound teeth are the passports to power, or that biting and grinding capacity have determined the course of history, but this I will maintain, that no nation has ever climbed to pre-eminence on carious teeth, or can retain pre-eminence when its teeth are no more, and that it behoves a conquering people jealously to look to its teeth and to keep them, not less than its weapons, bright and sharp. If I might alter Goldsmith slightly I would declare

> "Ill fares the land, to hastening ills a prey,
> Where gums accumulate and teeth decay."

It is not an edentulous race that will finally possess the world.

When we inquire into the cause of the greatly increased prevalence of dental caries in modern times we at once perceive that it is an instance of these imperfect adjustments which we often see in living beings in their passage from a natural to an artificial and from an artificial to a more artificial condition of existence. All advance in organic evolution involves danger and sacrifice, and in highly complicated organisms an advance in one direction often means retrogression in another, in which the power of adaptation is tardy, or where compensatory measures have not been adopted. The resources of civilization are more ample, nimble, and varied than those of dentition, and so it has come about that the teeth have not been modified in accordance with the altered habits of life of modern times, and especially of the nineteenth century, and have not yet been adequately protected by specially devised safeguards But in examining into the causes of the increase of dental decay which we see around us, we can go beyond a mere general statement of this kind and indicate, I believe, some of the specific conditions of modern life which are mainly responsible for it; and some of these specific conditions, as they present themselves to my mind, I venture, with great deference, to submit to your consideration.

In the first place, then, it seems to me that the greater prevalence of dental caries in these days is probably in some measure dependent on the softness and pulpiness of the food on which we for the most part feed. Hardness and toughness of food —and the food of savage and semi-civilised races is generally hard and tough—involve vigorous mastication and vigorous mastication involves a vigorous use of the teeth in their proper function and a copious flow of saliva, and a copious flow of saliva involves cleansing of the teeth and gums, to which the active movements of the lips, tongue, and cheeks during mastication largely contribute. But softness and pulpiness of food — and the food of all civilised races tends to become more and more soft and pulpy—means comparatively little mastication and use of the teeth and little mastication means a diminished flow of saliva, for the far-fetched condiments of refined cookery do not stimulate the salivary glands to anything like the same extent that ordinary sapid substances with energetic masticatory movements do, and a diminished flow of saliva means diminished cleansing of the teeth, which are at the same time imperfectly scrubbed by the feeble movement of the parts engaged in mastication, and so it comes about that when the food is soft and pulpy, particles of it lodge in and about the teeth and gums, to an extent that is impossible where it is hard and tough and afford a nidus for those bacterial growths which alike by the decomposition they set up, and their direct attacks are so inimical to the integrity of the teeth. It has been shown that the jaws and the muscles of mastication are larger in savage than in civilised races. I have little doubt it will be found that there is some atrophy of the parotid, submaxillary and sublingual glands in the latter as compared with the former, and then it will appear that tooth-brush and dentifrice are merely auxiliaries to a natural apparatus which has to some extent dwindled by disuse.

In the second place, I would suggest to you as a specific cause of the increase of dental caries a change that has taken place in a food stuff of a particular kind and of primary importance –I mean bread, the staff of life,—from which in the progress of civilisation the coarse elements—and the coarse elements consist of the outer husks of the grains of which it is composed—have been eliminated. In as far as our own country at any rate is concerned, this is essentially an age of white bread and fine flour, and it is an age, therefore, in which we are no longer partaking to anything like the same amount that our ancestors did of the bran and husky parts of wheat, and so are deprived to a large degree of a chemical element which they contain—namely, fluorine. The late Dr. George Wilson showed that fluorine is more widely distributed in nature than was before his time supposed, but still, as he pointed out, it is but sparingly present where it does occur, and the only channels by which it can apparently find its way into the animal economy are through the siliceous stems of grasses and the outer husks of grain, in which it exists in comparative abundance. Analysis has proved that the enamel of the teeth contains more fluorine, in the form of fluoride of calcium, than any other part of the body and fluorine might, indeed, be regarded as the characteristic chemical constituent of this structure, the hardest of all animal tissue and containing 95·5 per cent. of salts, against 72 per cent. in the dentine. As this is so it is clear that a supply of fluorine, while the development of the teeth is proceeding, is essential to the proper formation of the enamel, and that any deficiency in this respect must result in thin and inferior enamel. If, in our dislike to grittiness, which has run parallel to our addiction to soft and succulent food and in our preference for white and fine flour, we have cut off the main source of supply of fluorine to our systems, it is not difficult to understand how we may have thereby incurred comparatively feeble and unprotected teeth, with a diminished power of resistance to adverse influences and peculiarly liable to decay. For the dense close-fitting prisms of the enamel are to the tooth what its armour-plates are to a modern ship of war; and if they are easily penetrated, corroded, or worn away, then the fate of the dentine within is sealed. I think it well worthy of consideration, whether the reintroduction into our diet, and especially into the diet of childbearing women and of children, of a supply of fluorine in some suitable natural form—and what form can be more suitable than that in which it exists in the pellicles of our grain stuffs?—might not do something to fortify the teeth of the next generation.

In the third place, I would name to you, as a cause of increased dental decay in our population, the high nervous tension of our times and the impaired nutrition which that high tension frequently entails, either hereditarily, or by its operation on the individual life. It is everlastingly true that when the parents have eaten sour grapes, the children's teeth are set on edge, that when the parents have been prodigal of their strength, the children are impoverished in constitution. Intense vitality of the conjugating spermatozoon and ovum is necessary to give the new being a fair start on its career, and to impart to it an impulse which will carry it and all its tissues steadily through the perils and vicissitudes of development and maturity to the gentle declivity of kindly old age. Such intense vitality of the spermatozoon and ovum, is not to be expected when the parents who produce them are labouring under nervous exhaustion; so there are now vast numbers of human beings, the offspring of neurotic or neurasthenic parents, sent "into this breathing world," "deformed, unfinished," and "scarce half made up," whose teeth are delicate and destined to premature decay. The gastro-intestinal mucous membrane of the embryo, from which the pulps and sacs of the teeth originate may in such cases be supposed to have been wanting in formative energy, or the trophic influence from nerve centres which is exerted, if not during the papillary and follicular, certainly throughout the saccular and eruptive stages of dentition, may be presumed to have been defective. It is to be remembered that as early as the fourteenth week of embryonic life, when the membrane of the dental groove with its adherent follicles and their pulps are stripped off, there may be seen dental nerves running along under the follicles and distributing twigs to each of them; it is certain that from this time till the completion of dentition at the twentieth year, the development of the teeth is more or less under nervous control. It is not to be expected, I think, that robust teeth will grow and come forth in due order in children who are kept in a state of nervous excitement or overstrain. While I am quite satisfied that inherited tendencies are more potent than personal experiences in inducing the dental debility which we encounter in nervous children, I still cannot acquit our modern system of education, with the over-pressure into which it so often runs, of some share in its causation, directly through interference with the growth and eruption of the teeth, as well as indirectly through interference with digestion and secretion, and the consequent establishment in the mouth of conditions favourable to dental caries. It is, I think, corroborative of the view that nervous tension contributes to dental caries, that your statistics show that as regards caries, better class schools are in a worse condition than those in which lower class children are educated.

Better class children have, of course, more care bestowed on their teeth than those of a lower class, but they are at the same time of more nervous temperament, and are more subject to nervous strain. With the view of ascertaining how far dental defects and decay are associated with arrested development of the nervous system, I carefully examined, by the permission of Dr. Shuttleworth, and with his kind assistance and that of Dr. Tèlford Smith, the teeth of 113 idiots and imbeciles in the Royal Albert Asylum at Lancaster about a fortnight ago. I cannot here, of course, enter upon any details, or give even a general summary of the observations made, but I may tell you that there was not amongst these 113 idiots and imbeciles of an average of seventeen years, one denture perfect or approaching perfection. Dental caries was present in every case save three, and in one of these three cases, six teeth had been removed and in another two, so that there was only one boy out of 113 idiots and imbeciles who did not present evidence of past or present dental caries, and in him the teeth were crowded, displaced, and pitted. In a vast majority of cases the caries might be described as galloping and had been widely and deeply destructive, so that the mouths of these blighted creatures presented a lamentable spectacle and might, without hyperbole, be addressed by the dentist called in to examine them in the language used by Romeo when breaking into the vault of the Capulets :

> "Thou detestable maw, thou womb of death,
> Thus I enforce thy rotten jaws to open."

(To be concluded).

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The Annual Meeting of the Society was held on Tuesday, May 3rd, at the Grand Hotel, Aytoun Street, Mr. I. Renshaw, (President), in the chair.

New Member.

Mr. R. Baxter Booth, L.D.S. Eng., 9, Market Square, Crewe, was duly elected a Member of the Society.

TREASURER'S REPORT.

Mr. H. PLANCK read the annual financial statement, which showed a satisfactory balance in hand.

After reading the report, Mr. Planck congratulated the members on the flourishing state of their finances, which showed that their Council had acted with economy in the administration of the affairs of the Society.

ELECTION OF OFFICERS.

The following gentlemen were elected Officers of the Society for the ensuing Session :—

President—Peter Headridge.

Vice-Presidents—T. Murphy, G. G. Campion.

Treasurer—Henry Planck.

Secretaries—G. O. Whittaker (Council), P. A. Linnell (Society).

Librarian—W. A. Hooton.

Editor of Transactions—William Simms.

Members of the Council—William Dykes, F. W. Minshall, William Dougan, L. Dreschfeld, I. Renshaw, E. P. Collett.

Mr. RENSHAW then said that it was his pleasing duty to introduce to them their new President, Mr. P. Headridge, whom they all knew as a straightforward and upright gentleman. He knew he would preside over their meetings during the coming year with the dignity which the office demanded. He (Mr. Renshaw) only hoped that during his year of office his work would be as pleasant as his had been, and that the members would rally round Mr. Headridge as they had rallied round him. He had been proud to have such a willing and devoted host of officers round him during the past year, and he desired to thank them for their great assistance. He was sure that the work of any President was rendered most easy and enjoyable by the officers taking such an amount of pride in their work, and pain in executing every detail of it. He thanked them for the patience with which they had listened from time to time to his remarks, and the generosity with which they had looked over his shortcomings and failings. He would conclude by thanking them again for their kindness.

The retiring President vacating his position, the chair was then taken by the President, Mr. Peter Headridge.

VOTE OF THANKS TO PAST OFFICERS.

On the motion of Mr. Simms, seconded by Mr. G. N. Skipp, a vote of thanks was unanimously accorded to the retiring officers for their services during the past year, to which Mr. Renshaw and Mr. Collett appropriately responded.

The President said it was his duty to rise and thank them for the honour they had conferred upon him that evening. He might say that of his own accord he would never have sought that position, but having been one of the founders of the Society, and turning the matter over in his mind, he felt he could hardly refuse to accept the responsibility they had put upon him. He felt that he would require all their indulgence in the discharge of the duties of the office. He would, however, always do his best to make the discussions of the Society as interesting as he could, and he had no doubt about the matter if they showed him the same sympathy and support that they had done to his predecessor. He concluded by again thanking them for the honour they had done him.

Exhibition of Lantern Slides.

Mr. G. G. Campion afterwards showed a number of photographs, by the aid of the Optical Lantern, dealing with the subject of the extraction of the sixth-year molars, and made a strong appeal to the members to aid him in making a splendid collection for the Museum in connection with the meeting of the British Dental Association, which is to take place in Manchester during the present year.

The President, on behalf of the Society, thanked Mr. Campion for the excellent Slides he had projected on the screen, and for the valuable and suggestive remarks he had made in regard to them.

Dental News.

PRESENTATION.

At a meeting of the students of the Liverpool Dental Hospital, Mr. Parsons, on their behalf, presented a silver cigarette case to Mr. J. P. Roberts, L.D.S., in commemoration of his term of office as house-surgeon. In replying, Mr. Roberts expressed great pleasure at receiving this token of goodwill, and hoped that all the students would have a successful career, and avail themselves of the special advantages afforded them by the efficient tuition provided at the hospital.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

The presentation of the various scholarships, medals, prizes, and certificates awarded during the last two sessions took place on Wednesday, the 29th ult., Mr. J. Passmore Edwards being in the chair.

The following were the awards in the subject of Dental Surgery :—

1st. Prize, Certificate, and £6 : 6 : 0,—Mr. H. J. Stevens.

2nd. Prize, Certificate, and £4 : 4 : 0,—Mr. E. W. Harwood.

Certificates—Mr. J. W. Tomlinson, and Mr. F. T. Trott.

We notice that Mr. H. J. Stevens was also *prox. acces.* in Materia Medica.

LEGAL INTELLIGENCE.

At the Cirencester County Court, before his Honour Judge Ellicott, Mr. James L. Robertson, dentist, of Cheltenham, also practising at Cirencester, sued the Rev. J. B. McClellan, M.A., Principal of the Royal Agricultural College, Cirencester, for £6 6s. for a case of artificial teeth supplied to the defendant.

Mr. Heath, of Cheltenham, appeared for the plaintiff, and Mr. Haygarth, of Cirencester, for the defendant.

Defendant had paid £3 3s. and proportionate costs into court.

Mr. Heath briefly stated the facts of the case, and said no complaint had ever been made as to the teeth, but when the account was rendered the defendant wrote that he "expected" the charge to be three guineas, and declined an offer of Mr. Robertson to accept a return of the case, or to submit to the opinion of any respectable dentist as to the reasonableness of the charge.

In reply to his Honour, Mr. Haygarth said it was not a question of reasonableness of charge, but a dispute as to facts.

Mr. Robertson deposed that he had been in practice 23 years. In 1886 he had business transactions with the defendant in respect to his family, and the defendant asked him to reduce his fees, which he declined to do. He had no further transactions with the defendant until September or October, 1891, when having first attended the son, he made a gold plate for Mrs. McClellan with four teeth on it, the charge of which was four guineas, or a guinea a tooth. That plate was about one-third the size of the one made for Mr. McClellan. In December, 1891, the defendant came to him and said he had lost a front tooth and wanted a new one put in. After examination he told defendant it was useless to have a single tooth, as the gums had shrunk very much, and the case would probably be loose after it was made. He therefore advised a large plate to go to the back of the mouth as some of the other teeth were very loose, and by so doing if any of the other teeth were lost they could be added from time to time. Defendant left it to witness's discretion. There was no allusion to the expense, but witness mentioned casually that the size of the plate would increase the expense. He then took the model and now produced it, and the plate produced by the defendant being added to it, the witness pointed out that it was very difficult to make. Defendant was very pleased with it, and the state of the plate would show that it had been continually used since. From then to now no complaint had been made as to the plate. The account went in at Christmas, and after that he received a letter, dated Dec. 30th, from the defendant in which he complained of the charge and said he had "expected something like a charge of a guinea a tooth," and asking for a reduction. In reply, on January 2nd, witness wrote pointing out the reasonableness of the charge, and offering to take the case back, or submit it to the opinion of any respectable dentist. On Jan. 4th, defendant wrote that he could not accept the offer to return the plate as he was leaving home in a few days, but he was willing to meet the plaintiff half way and send a cheque for 4½ gs. That was declined. On May 18th, defendant in reply to a re-delivery of the bill, refused to pay more than 3 gs., except under direction of a court of law, adding that he was strengthened in his view by an article in *Truth* on "artificial teeth and artificial prices." Witness thereupon formally withdrew the offer to take back the teeth, and instructed his solicitor. There was from 30s. to 35s. worth of gold alone in the plate, and it would take an assistant a couple of days to make, apart from the cost of the teeth and his own skill and trouble. The fee charged was a very moderate fee indeed, and he could not have done it for anything less, unless he gave it away.

Mr. Haygarth said Mr. McClellan was defending that case because he objected to pay more than the sum for which he had made an actual bargain. It was a question of the facts, and he submitted that the patient would have a much more vivid recollection of these facts than the dentist. After Mr. Robertson had made a full examination of the mouth, Mr. McClellan asked him what the charge would be, and he replied that it would be a guinea a tooth. Mr. McClellan was satisfied with the charge. At that interview the plaintiff said two teeth would be required, but subsequently the defendant found three teeth were fixed, but he made no objection, and expected he would have to pay three guineas instead of two. It was not a question of *quantum valeat*, but of a bargain made and which should be carried out, and the reference to previous attendance on members of Mr. McClellan's family had nothing to do with the case, and could only have been introduced for the purpose of petty annoyance.

The Rev. J. B. McClellan then gave evidence bearing out this statement.

The Judge said the case was not without difficulty, but he thought the probabilities were in favour of the defendant. It was not likely that the defendant, as plaintiff alleged, asked nothing about the price, in fact, Mr. Robertson's remark that he mentioned casually that it would increase the expense if the plate was much larger pointed to some conversation about the charge. He thought it was probable the defendant asked the charge, and that the plaintiff said the charge was usually a guinea a tooth. He gave judgment for the defendant.

Mr. Haygarth said Mr. Robertson claimed to retain the case, but it belonged to defendant in return for the money paid into court.

His Honour directed the case to be handed to the defendant.

Plaintiff did so, remarking that the gold in it cost more than the sum paid.

APPOINTMENT.

T. E. Sherratt, L.D.S., Eng., has been appointed Demonstrator of Operative Dentistry at the Victoria Dental Hospital, Manchester.

Dental Hospital Reports.

Statement of Operations performed at the Dental Hospital of London, Leicester Square, during the month of June, 1892.

Extractions	Under 14	482
	Adults	1322
	Nitrous Oxide	1273
Gold Fillings		479
Plastic		1154
Treatment of Irregularities of Teeth—		174
Artificial Crowns		36
Miscellaneous Cases		577
Total		5497

House Surgeons B. Alfred Castellote, T. Herbert Clarence, Savill H. Hayward.

Work done at the Victoria Dental Hospital of Manchester, during the month of June, 1892.

Number of Patients attended	761
Number of Extractions	519
Number of Extractions under Anæsthetics	65
Gold Stoppings	39
Other Stoppings	145
Miscellaneous	272
Crowns	3
Irregularities	18
Total	1061

Frank L. Tanner, *House Surgeon.*

ANSWER TO CORRESPONDENT.

Frank B. C.—The first step is to get registered as a Dental Student by the General Medical Council. This can only be done by producing evidence of having passed a preliminary examination, and of having commenced dental study. Information upon the other Regulations for the License in Dental Surgery, can be found at p. 833 *et seq.* of the Journal for Sept. 15th, 1891. The only subject you can commence before registration, is the Practical Instruction in Dental Mechanics.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Strert, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.

2. We cannot undertake to return communications unless the necessary postage stamps are forwarded.

3. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only, and we also beg to call particular attention to the importance of a carefully-penned signature and address.

4. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.

5. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.

6. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under:

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THE EMPLOYMENT OF THE PERCEPTIVE FACULTY.*

By James Maughan, M.D. Brux., &c.

Mr. President and Gentlemen :—

The object I have in view in introducing this subject to your Society, is to urge upon you, both students and newly-fledged dental surgeons, the necessity of cultivating your powers of observation, and that at every available opportunity.

Useful as this advice is to men in every walk of life, it is in none more notably, I venture to say, than in the Dental profession. When a young man has put in his apprenticeship, done his hospital work, and passed his L.D.S. Examination, does he not fondly believe himself fully equipped for his work in life? Alas! it is too true with the great majority of men. There is one thing yet wanting, and that is the full development of the Perceptive Faculty. This is a task that takes years and years to successfully achieve. And so during your student career as well as in after years, I ask you to so train your powers of observation as to make this Faculty a storehouse of knowledge invaluable alike to yourselves and to those with whom you are in daily touch and sympathy.

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* Read at the Students' Society, National Dental Hospital.

Now as to the method of such training. Let it be part and parcel of your routine procedure with every patient, not only to ask questions, but to draw your own deductions from salient features in the patient's answers, physiognomy, and general behaviour.

And this is practicable without discomposing the mind of the patient or causing the least uneasiness.

Then in the administration of anæsthetics, your powers of observation should be continually requisitioned. Students apply the face-piece carefully, watch the breathing, and test the conjunctival reflex most assiduously, while all the time they are only administering air, having forgotten to turn on the gas.

In private practice, I find the vertical position of the gas bottle far more desirable than the horizontal, the risk of freezing at the screw being less in the former position. But, however you may place your bottle, do not put it on the fire to melt the frost at the screw. This was actually done in a recorded case, and the result, of course, was a disastrous explosion.

Then again, history repeats itself in the frequent mistakes made with glass eyes. Surely, I need not say how futile it would be to watch a glass eye to ascertain the stage of anæsthesia the patient has arrived at. These eyes are so cleverly made now-a-days, that I can assure you it is very easy to make a mistake.

Now as to the indications of anæsthesia, the first reliable sign is a fixed, unintelligent stare in the eyes, and I am in the habit of stopping the gas at this point, if the operation is very short, and the patient the victim of fatty degeneration of the heart. In all ordinary cases, however, it is desirable to push the anæsthesia further, until the respiratory pause supervene or the movements of the eyes, fingers and respiration become clonic. Neither this, nor the succeeding cyanosis, need give rise to the least alarm. When these symptoms are witnessed for the first time, there is no doubt something gruesome in the spectacle, but when asphyxia thus overtops anæsthesia, you will notice the administrator watching the respiration and the colour of the lips. If a rosy hue is stealing into the face of the patient then all apprehension is at an end, the respiration resumes its usual rhythm, the eyes open first with a blank stare, and then with a look of consciousness. My usual practice is to keep the eyes and the ears closed until some act of consciousness manifests itself, then I say successively, "Open your eyes," "Open your mouth," (to remove the gag), "Lean forward,' "Spit out the blood," "Hold the spittoon in both hands," "See what you are doing," "Wash out your mouth with some water." These may seem trivial details, but patients understand them readily, and they indicate very fairly, the grip of the mind during the gradual evolution to a full consciousness.

When the operation is over, see that the gas is turned off, else the gas-bag might explode and this noise occurring while the patient is regaining consciousness would be much magnified by the, so to speak, nascent sensorium, and so cause unnecessary terror and excitement.

There is a strange condition that sometimes follows on the Nitrous Oxide anæsthesia, but one that fortunately causes no anxiety. It is the persistence of that glassy unintelligent stare of the eyes, and an anæsthetic condition of the nerves, though all the other symptoms of the gas may have passed off and the face resumed its normal colour. It is a condition in which I have been able to advise the surgeon to continue his operation to the extent, on one occasion, of eight extractions. On all such occasions the patient has emphatically repudiated the suggestion that the latter part of the operation was felt, and moreover, there was no reflex act evoked. The pathology of such cases I do not attempt to define, but as far as my observations go, they have only occurred in neurotic patients.

And now to come to the more general part of your work, let me give you a hint or two that may serve you in good stead. When a case comes to you, let your diagnosis be careful and honest, and your treatment the same. It is both unnecessary and unwise to explain a lot of pathological details, but state your opinion briefly and to the point, and advise the treatment you know to be best. You will find such advice, trite though it be, the best to follow.

At the outset of your career, I would enjoin upon you the resolution never to tamper with your conscience. There will be abundant opportunity for a laxity in this direction, but if you act up to the best you know, you will always have the happy and wholesome satisfaction of having done your duty.

A little while ago I was terribly puzzled over a case of apparent vomiting of blood. The young woman was bringing up a large quantity of what looked like blood and mucus. I took a handkerchief stained in the fluid and succeeded in puzzling many of you. However, on microscopic examination I found no blood at all. The girl had swallowed some cochineal and water. She gained the deepest sympathy of her friends until I exposed the deception.

Cases like these come more into the physician's domain than into that of the surgeon ; still you may get a case one day that will require all your tact and acumen to diagnose correctly. In dealing with female patients, I should advise you, whenever possible, to have a third person in the room, if your operation is one that will probably take a considerable time in the doing.

As to the encroachments of the dental surgeon on the territory proper of the physician or surgeon. All the arguments under this head could be resolved, by a common *esprit de corps* to seek for further advice when the symptoms of our patient wander off into the province of a sister profession.

A case in point frequently arises where dental surgeons of unimpeachable integrity extract teeth to relieve a neuralgia which proper hygienic and medical treatment can alone remove.

Pain and neuralgia are such wide subjects that I can only touch upon them here. One-sided headache, pain in one ear or in the neighbourhood strongly suggest a one-sided cause, such as a carious tooth on that side. But on the other hand, migraine commences as a one-sided headache, and an inflamed tonsil may cause a painful ear-ache.

The supposition of a dental origin of the pain would be considerably strengthened if (1) there is a carious tooth on the same side as the headache ; (2) that there is a history of the tooth aching before the head ached ; (3) that percussion, heat or cold, on the tooth revives the pain and reveals the track it takes to the head.

One word more, and I have done. Respecting the ethics of your profession, they may be summarized in this motto : "Do unto others what you would wish them to do unto you," and I need hardly add, cultivate charity for the mistakes of others.

FLORAL DENTINE.

Powdered cuttle-fish bone	15 drs.	Oil of lemon ...	... 70 drops
Powdered Precipitated chalk	5 oz.	,, rose geranium	... 40 drops
Powdered orris ...	20 drs.	Honey, strained ...	... 10 drs.
Carmine ...	5 grs.	Syrup	... 5 oz.

Triturate the solid ingredients to a fine powder, add the oils, then the syrup and honey, and thoroughly mix.

CASES FROM PRACTICE.*

By H. G. Read, L.D.S., M.R.C.S., L.R.C.P., &c.

There is a tendency to refer all cases of swellings of face and neck to the dentist. Even medical men do this, often without examining the patient's mouth themselves. There is also a tendency among specialists to find a cause in their own particular branch to account for any irregularity occurring in the region they favour. Now, dentists are no exception, for while the medical student is cultivating his observation, the student of dentistry is improving his manipulative dexterity. So, when a patient with a swollen face, or neck, calls on the dentist, he is apt to say, "open your mouth," and, having found a carious tooth, extracts it in the firm belief that he has found the cause of the swelling and removed it. In nine cases out of ten he is in no doubt quite right, but he falls easily into the trap when the exception occurs.

Pain is a pitfall in diagnosis for many reasons; it is at the best an unreliable symptom; it affects individuals in such a different manner; and then, again, we have to judge of its intensity by an account given to us by the patient.

With these few preliminary remarks, I mention some cases from practice, jotted down with a view to assist the discussion this evening.

(1) Last year a hysterical young lady was brought to consult me. She complained of pain in one or two perfectly sound teeth. She had been to two good dental surgeons, and each had extracted a tooth, but refused to do any more. On each occasion she obtained slight relief, but I declined operating, as I considered it a medical case. However, I have since heard that she succeeded in getting all her teeth

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* Communicated to the Students' Society, National Dental Hospital.

extracted, and that she was still suffering as badly as ever from neuralgia.

(2) A nurse at Bartholomew's Hospital came to me two months ago, and complained of pain in an upper molar. There was slight periostitis, but on examining a little more closely, a tooth-brush bristle was seen just under the gum. This was, of course, removed, and the pain disappeared simultaneously.

(3) An old woman among the out-patients at Bartholomew's complained of a swelling over the right malar bone. She was sent on to me, but I found the cause really was due to a heavy packing case, which had fallen on her.

(4) A man suffering from a swelling over the left malar bone, was sent on to me, and I ascertained the cause to be a blow from a crowbar.

(5) A child was referred to me with a swelling extending over the chin. I found she had fallen down and knocked her chin against the kerbstone.

There were no lesions in either of these three cases, which required the assistance of a dental surgeon.

(6) I had a case of fracture of the lower jaw this morning. His history was that several roughs set on him two days previously, and that his face had been much swollen since. I asked my two dressers to examine the case and state their opinion. They both diagnosed Alveolar Abscess at once.

I might add that irregularities in the position of teeth after a fracture has united, tend to right themselves to a large extent.

(7) Referring to the fistulous openings one gets inside and outside the mouth, and the odd causes of some of them, I might say I had a patient, aged 40, who came to me complaining of several openings in the gums, and which were discharging continually into his mouth. He gave a history

of Syphilis, and also of having taken enormous quantities of mercury. On passing a probe along these channels I came down on tooth-substance in two places, and at two other spots (in different jaws) I came down on bare bone. I diagnosed two unerupted teeth and necrosis at the other two points. Chloroform was administered, and I was assisted by a well-known surgeon. After I had removed the two teeth, he made an incision, reflecting the gum and periosteum from the spots where bare bone was felt. In both cases teeth were found deeply placed. They were extracted, and this man's symptoms vanished. One of those teeth was a lower wisdom. It was situated in the ascending ramus, (above its own level), and at right angles to its natural position.

(8) A. B. had a left lower molar filled with amalgam at a seaside town ; it was a dead tooth, and as the pulp was not removed, an abscess formed, the pus passing beneath the reflexion of mucous membrane from jaw to cheek, and bursting at a point where the crown of the second lower bicuspid was touching the cheek, this tooth being displaced outside its normal position in the arch. As a result there was much thickening, with some ulceration. Three medical men met, and diagnosed Epithelioma of the cheek. He was sent to London to have it operated on, but the surgeon sent him on to me. I removed the offending tooth and so cured the patient.

(9) Dr. C.'s daughter, aged about 9, was brought to me with a swelling on the left side of the lower jaw. On examination, I found it encircled the roots of the 2nd left temporary molar in the lower jaw, that this tooth was carious, and that the swelling was painless. She had noticed it about six months, and Dr. C. believed it to be an abscess, especially because the gum was hyperæmic and contained fluid. I diagnosed a cyst, and removed the carious tooth as a possible ource of irritation. She was then seen by Mr. L. He

opened the swelling and found it consisted of small cysts with thick vascular walls. Three weeks later, the growth had increased greatly in size, and sarcoma was diagnosed, and this diagnosis was confirmed by microscopic examination. Her friends declined to allow any further operative measures, and the patient died in a few months.

(10) Alongside the previous case, I should like to quote the case of a young surgeon who called on me to have a left upper bicuspid extracted. Before operating, I pointed out a swelling situated above the roots, remarking that it was a dental cyst and would probably discharge and collapse when I took out the tooth. He doubted my diagnosis, remarking that two surgeons of note had said it was a new growth, and should be removed with some bone where it was attached. After the operation he found the swelling was gone and there were Cholesterin crystals in the spittoon.

(11) 1 once saw a case in which the crown of a lower bicuspid projected through the wall of a dentigerous cyst. It had gum and a thin layer of bone over it, and close resembled an exostosis.

(12) Cases of Mumps and Erysipelas have been sent to me by medical men, who believed the swelling due to toothache. Needless to say, the thermometer, and a careful observation of the symptoms indicated the nature of the case at once.

(13) A man suffering from inflamed bursæ of elbows, was admitted into the hospital, and I was his dresser. One day on examining his tongue, I found a small ulcer with raised edges and hard base. I diagnosed Epithelioma, and expressed the opinion to a House Surgeon, that some rough teeth were the cause. The visiting surgeons saw the patient and decided that that part of the tongue should be removed. A day was fixed for the operation, and I filed the teeth before-

hand. However, he became feverish, and when he recovered the ulcer had gone. Thus the accidental onset of a fever saved that man from an unnecessary operation.

(14) A girl, aged about 18, came to me complaining that her two lower centrals were growing apart. She said that she had noticed the space between these teeth had been gradually increasing for some months. On examination, I found a purple elastic swelling; myeloid epulis was diagnosed, and it was removed by Mr. T. Smith.

(15) A man, aged 48, came to the National Dental Hospital to have his 2nd left upper molar removed, because it made his face swell, so he alleged. The history was that the swelling had been there for several months, and was growing steadily bigger and bigger. There was slight pain and tenderness ; occasionally there was a discharge of blood from the left nostril. On examination, the antrum was found distended, an exploratory incision revealed a solid mass with spicules of bone in it. The case was diagnosed as Malignant growth of the Antrum, but he refused to allow a surgeon to operate ; so he was lost sight of.

Œdema of the face, due to an ulcer on the face, or associated with an unhealthy cracked lip, requires recognition by the dental surgeon. Primary chancres are seen from time to time in the mouth, on the tongue, gums, cheek, or lips, and should not be overlooked. Enlarged glands in the neck have been the means of causing many teeth to be extracted which had in no way influenced them, although undoubtedly bad teeth often cause glandular enlargement.

Finally, attention may be drawn to the fact that an alveolar abscess in connection with the lower jaw sometimes leads to considerable local expansion and thickening, which persists long after the cause has been removed, and which may be difficult to diagnose if there is no distinct history to guide one.

AMALGAM.

By Thomas Fletcher.

There are several important points in Mr. Byrne's paper, published in the last issue of the Journal, which need correction. The wonderful properties attributed to gold in an amalgam are entirely new to me ; it is probable that I have made a greater number of experiments on this point than any one else ; and the action of gold, in my experience, is simply to make any amalgam pleasanter, and cleaner in working. It certainly does not "increase the rapidity of setting," but the reverse, and the same effect is also visible as regards edge strength. In many except very small proportions, it interferes with the setting, and introduces undesirable properties. The properties attributed to antimony are those of bismuth, this is probably a clerical error.

Mr. Byrne once again raises a question with reference to platinum in an amalgam, which has been settled a dozen years ago. Its action is to cause quick setting and hardness, giving an alloy which contains it, many of the properties of a pure precipitated silver amalgam without the great discoloration of the latter. If an amalgam containing platinum is mixed soft, and not allowed to set rapidly, the peculiar advantage of this metal is entirely lost, and its presence is no advantage whatever, if anything it is the reverse, for this reason it is possible to get good and bad results with the same alloy.

The necessity for weighing the properties was pointed out by myself years before Dr. Flagg entered into the matter and my special balance for the purpose of obtaining correct proportions without weights, was in common use long befor he told us anything about it, Mr. Byrne's theory that metals require a quantity of mercury in proportion to their melting points is one not founded on fact; gold requires an exceedingly small quantity, palladium requires 3 or 4 times its own weight.

With regard to the methods of inserting amalgams, Mr. Byrne entirely omits the best of all, i.e., to pack as dry as possible, and to burnish or mallet the surface with a layer of tin foil over it, to absorb the mercury which rises to the surface. If he will once try this properly, he will not need to trouble about either "spheroidal tendency" or any other method of filling. It is not necessary then to see a patient again, "after the amalgam has hardened"; a good amalgam treated in this manner is hard enough to polish at the time it is inserted, and hard enough for mastication in 10 minutes, if the plug is small, or 15 minutes if it is a large one.

A New Filter.—By the ordinary arrangement of filters it is too much to expect that the micro-organisms are weeded out. A new one mentioned recently to the Académie de Médecine claims to reduce the number of germs from 1,200 per cubic centimetre to less than ·20. This sterilisation is achieved by adding certain substances which precipitate the organisms. A current of air passes through large reservoirs having a thick layer of iron filings; after the water has percolated through this, it is received into huge cemented tanks, and is ready for use in twenty four hours. It is said to contain CO_2, but no iron, and has a sparkling appearance with a slightly acid taste. A modification should be used in houses; alum, sulphate of iron, or prepared chalk being employed.

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METROPOLITAN HOSPITALS.

The interest taken by the public in these Institutions has again just been made manifest in the annual collection made on their behalf, and if from time to time regretable incidents are recorded, it would seem that the public mind is ready to make allowances for them in the face of the magnitude of the field of work, and the multiform interests involved. The recent investigations and recommendations of the Committee of the House of Lords will, upon the whole, tend to encourage a continuance of the public sympathy, and as Lord Sandhurst intends to issue invitations to the managers of the hospitals to take part in a conference on the subject, we shall watch with interest the opinions expressed as to the creation of a Central Board. As at present suggested, this board would consist of 49 members representing different groups of those interested in the welfare and good management of the hospitals. Thus, the general hospitals would have twenty representatives, and the special hospitals and provident dispensaries would be represented by a similar number, the dental hospitals having one of these. The General Medical Council, the licensing bodies, and General Practitioners, are down for one each, whilst the London County Council, and the Sunday and Saturday Funds would also be represented.

Various proposals in connection with the suggested board were discussed in the Report, and amongst other opinions expressed, it was thought that as there would be no Government grant forthcoming, it would be unwise to arrange for a Government inspection, as this might diminish the amount of voluntary contributions. With regard to the duties of the Board, it was not proposed that there should be power given to it from a licensing point of view, but rather that there should be a collecting of annual reports and statements as to the finances, and of returns as to the number of patients treated. These having been considered, the Central Board would then, itself, issue an annual report, and it is evident that possible praise or blame of individual institutions would have a good effect in promoting efficient management. Altogether, it would seem of great advantage to all concerned, that such a new departure should be brought about, provided all interests are fairly represented in the constitution of the Board.

There is another point of interest, from a practical point of view, which may be briefly alluded to. It refers to the immense amount of clinical material awaiting the students' attention in the Poor-law infirmaries. The class of cases met with in these varies from the ordinary run of case encountered in the General Hospitals, but, in our opinion, is none the less of value to the future practitioner. We are apt to overlook the fact that there are some four thousand more beds in these infirmaries than in the voluntary hospitals, and it is to be hoped that before long some definite arrangements may be made for students to avail themselves of such an opportunity for study, especially as it would also tend to the good of the patients. Perhaps, in view of the new regulation, the advanced student, in his fifth year, might be drafted to the Poor-law infirmary, and render assistance to an over-worked medical Officer. Some such scheme has been mooted for some time past, but, as the Committee of the House of Lords seem favourably disposed, a recommendation from such a source may prove to be the one thing needful to bring about the accomplishment of a reform so much to be desired.

ANOTHER NEW DENTAL APPOINTMENT.—It is satisfactory to report another instance of an Authority, *in loco parentis* to pauper children, realizing its responsibility. At a recent meeting of the Strand Board of Guardians it was announced that the Local Government Board had approved of a resolution, already passed by the Guardians, in favour of the appointment of a qualified dentist to attend the children at the Edmonton Schools. A discussion ensued, and the chairmain appears to have stated that this was the first appointment of the kind made by any metropolitan or provincial board of guardians. Other remarks were favourable to the scheme, one of the speakers referring to the approval of the regular medical and surgical staff, and the absence of any narrow-minded professional jealousy. This accords with our own experience of similar cases, and with regard to the latter phrase, it is difficult to imagine, indeed, how such a feeling could arise. It seems the Superior Board objected to the salary being charged to the common fund ; we hope the dentist will get remuneration from *somewhere*, although at this early stage of such appointments, it is too much to expect that all parties concerned will be able to agree as to what the sum should be. However small, we hope that the gentleman appointed will do his best to show good results, the most important perhaps being an accurate record of all the work done, so that it may appear what proportion of conservative treatment is possible under such circumstances, as contrasted with the list of extractions produced in some instances.

EYE-STRAIN AND NERVOUS DERANGEMENTS.—Dentists are occasionally reminded, by articles and papers in Journals, of the importance of paying attention to their eyesight, and it would seem necessary, for reasons other than those connected with the margins of cavities and similar points, to recognise the possibility of effects additional to the merely immediate subjective ones connected with vision. According to Dr. Ambrose Ranney, the successful treatment of many very distressing conditions depends upon the discovery o "eye-strain" as the cause of the trouble. He reports having cured cases in which the symptoms were those usually indicating organic diseases, and that by the use, of proper glasses and appropriate treatment he had successfully dealt with four cases of epilepsy, several mental cases, and others in which insomnia, neuralgic paroxysms, and constant headache, were marked symptoms. In some of these therapeutic treatment had been tried without any effect.

VETERINARY SURGEONS.—Since the Veterinary Surgeons Act was passed in 1881, efforts have been made to improve the position of those practitioners who have been properly educated. It has recently been argued that, considering the present state of veterinary science and practice, four years is none too much for the thorough training of students, and the statement is supported by pointing out, rather quaintly, that a prolonged period of study is even more necessary for veterinary practice, than in the case of the medical student who has to deal with one animal only. As some of our readers may remember, a legal decision was obtained not long ago to the effect that the use of the term "veterinary forge" was a description infringing the Veterinary Surgeon's Act, and since then persons other than farriers have been notified that they must not use the word "veterinary." It would be well if the use of the word "dental" could, in an analogous manner, be held to suggest that the user claimed to possess special qualification to practise dentistry.

ANOTHER DEATH FROM CHLOROFORM.—A fatal case is reported in the *Zahntechnische Reform.* The fourteen year old son of a land owner requested a dentist of Soest to extract a tooth, and, as the patient appeared frightened, chloroform was administered. The operation was successfully performed, but the boy never recovered consciousness. The case is perhaps rendered more sad by the fact that the deceased was an only son.

STATISTICS OF ANÆSTHETICS.—The twenty-first Congress of the German Association for Surgery decided at its third Session on June 10th, to continue the investigations as to anæsthetics, in order to obtain a more extended calculation. The President, the Privy Councillor Bardeleben, requested the members to observe and record the notation already made use of, and to continue their former reports up to the end of February, 1893. Accurate notes extending over long periods would also be very welcome, except, of course, those already reported in 1891-92. The following are the points upon which information is requested. 1st.—The time of the observation. 2nd.—A statement as to the agent employed, and its preparation, whether chloroform, ether, or a mixture, and how often each was used. 3rd.—The respective sources of the same. 4th.—The apparatus employed. 5th.—A statement of the duration, in unusually long cases (one hour and over), of the anæsthesia. 6th.—The quantity consumed. 7th.—Whether, and to what extent, injections of morphia were also used. 8th.—Ill effects with, or after, anæsthetics (a) asphyxia (tracheotomy), (b) Cases of death, (c) possible ill effects, especially after ether.

AN IMPACTED TOOTH-PLATE.—A case is reported in the *Medical Press and Circular* in which a vulcanite plate with two teeth was extracted from the œsophagus of a patient under the care of Mr. Lennox Browne, at the Central London Throat and Ear Hospital. The history showed that when the patient swallowed the plate three and a half years previously an unsuccessful attempt to dislodge it was followed by several other attempts under chloroform at St. Bartholomew's, and he was told to carefully examine the motions, which he had done ever since. Difficulty and pain in swallowing increased, the voice was husky, and an unpleasant sensation of taste and smell was due to the expectoration of "stinking matter." Mr. Lennox Browne found a foreign body, apparently about two inches below the level of the cricoid cartilage, and under chloroform the plate was drawn into the pharynx, and finally removed with a pair of "crocodile" forceps. It was then noticed to be fractured, but the remaining portion was immediately recovered with an umbrella probang, and the patient was soon discharged cured. The fracture suggests that a modification of the treatment might be found possible in some other instances, where the plate is of vulcanite. If the foreign body could first be seized in a suitable manner by a sufficiently strong pair of forceps as to split it, the fragments could be recovered separately, or at all events have an opportunity of passing downwards, and we should have an operation somewhat analogous to lithotrity, but with not much room to work in.

A Tooth in Court.—Or at least the root of one. The Australian papers contain reports of the trial of an action in which a dressmaker sued a dentist for the recovery of £200 damages for an alleged unskilful operation. It seems that a pivot crown was applied to an upper incisor root, that there was afterwards periodontitis, and that the tooth was finally extracted. The split root was produced in court and examined by the judge and the lawyers, with a magnifying glass, two points being raised; whether the fracture occurred before or after extraction, and whether there had not been a false passage made through the side with a drill. Some half-dozen witnesses gave expert evidence, and, as is not unusual, their opinions did not agree. The case lasted several days, and the judge declined to give detailed reasons for his decision as he had no wish to do mischief. Some very violent passions had been aroused, and there had been serious previous disputes between two of the plaintiff's witnesses and defendant. In such cases expert evidence had to be carefully dealt with, and the case had given him great anxiety. From first to last it had been one of direct contradiction, and after carefully considering every particular in connection with the case, he felt bound to return a verdict for defendant.

A NEW DENTAL JOURNAL.—We have just received the first number of a new journal, *La Revue Internationale d' Odontologie*, published under the direction of M. Paul Dubois, with the assistance of eight other professors in the Paris Dental School. All these gentlemen have previously been connected with *l' Odontologie*, which is still published under a new management. The founders of the new journal have made arrangements to secure its financial existence for several years, but the first number gives good promise that its professional and literary success will be also assured. It is intended to be an independent journal, outside personal questions, and not subject to change by the vote of a majority. The copy before us contains an excellent illustrated account of the demonstrations recently given by Dr. Herbst at Paris, besides several articles and other matter interesting to Dentists.

Abstracts of British & Foreign Journals.

THE INTERPROXIMATE SPACES.

By G. V. Black, M.D., D.D.S.

The oppositions to which attention is directed are these.

1st. A healthy gum septum of good form, or filling the inter-proximate space, is necessary to the cleanliness of the space. 2nd. An interproximate space not filled by the gum septum, and of such form as to retain food débris, serves as a pocket for the accumulation and decomposition of such debris with the formation of acid products, which cause the beginning or recurrence of decay of the teeth. 3rd. An unhealthy gum septum and an unclean space, are a constant menace to the health of the peridental membrane, and a frequent starting point of disease of a serious character. 4th. Proximate fillings must be so formed, and finished, as to produce a proximate contact that will not hold food debris in its grasp, nor leak the same into the interproximate space during mastication, and thus injure or destroy the gum septum. Thus will be maintained, with the greatest certainty, the health of the teeth, the gum septum, and the peridental membrane. 5th. The full width and proper form of the interproximate space must be maintained so that the gum septum shall have sufficient room to maintain its health and perform its functions. Bad forms of the interproximate space should be improved when treating proximate surfaces. 6th. When the interproximate space has been lost, or its width diminished, by previous loss of the contact points of the teeth from caries, which has allowed the teeth to drop together, the space must be regained by judicious wedging, and the fillings so formed and finished that the width of the space shall be maintained. 7th. The gum septum must not be seriously injured by the use of wedges in separating the teeth, by temporary fillings crowded against the gums while treating pulp cases, nor by the improper use of instruments in finishing fillings.

The first proposition, that a healthy gum septum of good orm, or filling the interproximate space, is necessary to the cleanliness of the space, would seem to need no argument to make it apparent to every one; for if the space and gum septum are not of such form as to be self-cleaning, or the space is not perfectly filled by the gum septum, it simply becomes a catch-basin for débris. This is true except in abnormally broad spaces without contact of the teeth. This condition can rarely be produced artificially. The artificial production of permanent separations to obtain self-cleaning spaces was extensively tried in the first half of the present century, and its failure is so generally admitted that it may be dismissed with this reference

There is one principle that obtains in the make-up of every good interproximate space, and that is a form of proximate contact that will not hold food débris in its grasp. This does not depend entirely upon the rigidity of the contact, or the firmness with which the teeth resist separation, but upon form.

All know that the teeth have motion in their sockets, much restricted certainly, but still a certain amount of motion, by which the contact points are rubbed one upon another. Suppose, for illustration, we take two marbles with perfectly polished surfaces and press them together, giving them ever so little sliding motion upon each other, and at the same time press some particles between the contact points and try to make them stay in the grasp of the contact. It will be found impossible, such things slip out one way or another. Now this is the principle of the contact between the teeth? It is the contact of rounded surfaces in which the actual contact is a small point rounded quickly away in every direction, so that débris of any kind forced in is quickly removed by natural processes. In the study of the best formed arches we find the contact between the teeth based on this principle from the incisors to the molars, and the contact is effective in maintaining clean spaces; while as they diverge toward broad flattened contacts they are correspondingly faulty.

In this respect we find a constant gradation in comparative anatomy, from the sharply rounded contacts that prevail in the carnivora that eat tough stringy food, to the broad, flattened contacts in those animals that subsist largely on grain or brittle food, of which the horse will serve as a type. In the omnivora we find a middle form between these extremes. In man this middle ground is generally maintained, but we will find gradations that in a degree typify them both. In some we find very strong square tooth crowns that proximate with comparatively broad, flattened surfaces, while the majority of even broad crowned teeth form contact with rather small round points. In the long bell-crowned teeth the contact points are much rounded and small in area though the teeth may be large. The contact between the marbles which I have given as typifying the contact between the teeth is substantially correct, but the contact points of the teeth are not perfect spheres as in marbles. They are generally more rounded in one direction than in another. And in many instances the mesial surface of a tooth is nearly flat at the contact point while the distal surface of the neighbouring tooth is sharply rounded.

It is of the utmost importance that the full width of the interproximate space be preserved in order that the gum septum shall have sufficient room for the maintenance of its tissue in the full measure of health and function. It is a matter of observation that wide interproximate spaces rootwise from the proximate contact maintain the health and cleanliness of the teeth better than narrow ones, or that bell-crowned teeth are, other things being equal, cleaner and healthier than teeth with thick necks and narrow interproximate spaces. While we cannot make bell crowned teeth of thick necked ones, we can maintain the full width of the spaces provided by nature ; and this should always be done by gaining sufficient room to complete our filling to represent the full original mesio-distal diameter of the teeth. In no case in which there has been original contact can this be done without artificial separation of the teeth for finishing the fillings. Separation by the use of the file is no longer to be thought of. It does not give the room we want, and is bad practice. The dentist of to-day has no use for the separating file as such. But we are called upon to do more than maintain the space. The contact points are frequently destroyed by caries, and the space has become much narrowed by the teeth dropping together before patients apply for treatment, and occasionally this has proceeded so far that the necks of the teeth touch each other, annihilating the space altogether. In these cases it is not a question of obtaining room for operating, but a question of regaining the lost interproximate space.

In some cases we cannot expect a complete renewal of the tissue, that is, the interproximate space will not be filled to the contact point. In these the form of contact is all the more important, and especially it should be sharply rounded, and narrow, from buccal to lingual. Then the tendency will be for the short gum septum to assume the arch form, being highest just under the contact point. In this case the gliding of the food to the buccal and lingual during mastication will drag out all particles that may be forced in past the contact point, and keep the space clean. A close examination of mouths in which the septa have become short, and in which the spaces remain clean, will show plainly that this is the principle upon which cleanliness is maintained. A little study will enable us to copy them in our operations.

The Dental Review.

PULP PROTECTION BY CAVITY LINING.

By G. F. Cheney, D.D.S., Vermont.

In teeth where there is the slightest chance for the pulp to become injured by thermal influences, the safe course is best. Too much thought and care cannot be given to the protection of the pulp. We must always bear in mind the larger proportional size of the pulp in early life, the possibility of its occupying an abnormal position, the chances of there being a crack or fissure extending to it, and of a point of it coming nearly to the surface.

The difference between sensitive dentine and tenderness of the pulp, must also be diagnosed. Sensitive dentine responds when excavating over a considerable portion of the cavity walls, does not respond to simple pressure; while, when in near proximity to the pulp, it responds quite as readily to pressure as to the cutting instrument, and is confined so completely to a single point, that the danger is at once suggested to the operator.

In deep-seated cavities, the necessity of caution becomes greater, and the danger of intruding upon pulp territory increases, and, unless carefully protected, thermal changes may prove a disturbing influence, which will give rise to more serious trouble.

For the protection of the pulp against these influences, something should be used with as little conductibility as the case will admit. Scores of different materials have been in use, amongst them, varnish and the various zinc plastics, oxyphosphate, oxysulphate and oxychloride of zinc. To the author, varnish is the most useful. He uses the sandarac gum, dissolved in alcohol and quite thin. The effect of varnish lining is to leave upon the cavity walls a thin semi-opaque whitish film which is non-conducting, non-irritating, insoluble and more in harmony with dentine than any metallic substance, and can be used in any cavity, no matter how shallow, because of the small amount of space it occupies. The operation of varnishing, is very simple ; having the rubber-dam adjusted and the cavity properly dried, a small pellet of cotton is dipped in the varnish, which is thus conveyed to the cavity touching the bottom and walls. Five or ten minutes should be allowed for hardening, which can be hastened by hot air.

In approximal cavities of the posterior teeth, especially those extending below the gum margin, we sometimes find ourselves in close proximity to the pulp, with barely depth enough for anchorage to the filling. The author finds nothing else will take the place of varnish in these cases for a lining. Varnish will prevent filling material showing through thin enamel walls, which might be very unsightly without it.

Oxyphosphate of zinc is an excellent liner, it is adhesive, does not shrink, and is indicated where the walls of the tooth need strengthening. In deep seated cavities, where undercuts exist, if the enamel is strong, it need not be cut away, for when hard cement is carefully packed in its place, it forms a support when hard, almost equivalent to dentine. A cavity cut in it to a depth a little greater than enamel, reduces the final filling with gold to an operation of the simplest character, as this cavity has a hard, firm base of cement, and a boundary of cement and tooth substance, or of the latter alone. When using an oxyphosphate in deep-seated cavities, we must not forget the necessity of protecting the pulp against the effect of phosphoric acid. This can be done by varnishing the bottom, or by using a little oxysulphate of zinc, or a pad of oxide of zinc and oil of cloves.

Oxysulphate of zinc is probably one of the best pulp protectors which has ever been used, is easy of adaptation and perfectly non-irritating, alike to sensitive dentine and to the dental pulp, and is probably the best material to be used where the pulp is nearly exposed. Place a small amount of the thinly mixed oxysulphate over the bottom of the cavity, allowing a few minutes to set, then finish the lining by covering it with oxyphosphate of zinc.

Oxychloride of zinc, although used quite extensively, is not a reliable liner except when used in small quantity, it being a notable shrinker when used in bulk, which makes it very much inferior to the phosphates when we wish a strengthener for the cavity walls. It is irritating and should not be used near the pulp, except over varnish or oxysulphate. It has been said that oyxchloride of zinc permits of no decay in adjoining tooth structure.

The Ohio Journal of Dental Science.

PERMANENT CLOSURE OF THE JAWS.

By Wm. Knight, M.D., D.D.S.

Permanent closure of the jaws is the result of many affections of the tempero-maxillary joints. It may be due to a severe sprain or concussion or arthritic inflammation leading to a deposition of plastic matter, and the conversion of this substance into cellulo-fibrous cartilaginous or osseous tissue. Again, permanent closure of the jaws may follow the exanthemata, as in the case of scarlet fever, reported by Dr. Maas, of Breslau ; or be caused by pressure of a tumour in the parotid region, making a direct pressure upon the tempero-maxillary joint. Immobility of the jaw is occasioned in rare instances by an osseous bridge extending from the lower jaw to the temporal bone. Dr. Samuel Gross writing upon this subject, says, " However induced, the effect is not only inconvenient, seriously interfering with mastication and articulation, but it is often followed, especially if it occur early in life, by a stunted development of the jaw, exhibiting itself in marked shortening of the chin, and in an oblique direction of the front teeth." The treatment of this distressing condition has been until recent years most unsatisfactory.

The suggestions of Prof. Esmarch, to form an artificial joint in front of the contraction has been productive of much good. Previously to this time, Diffenback had rcommended, as well as tried, the formation of an artificial joint, but behind the contraction, and naturally without any good result; since the impediment to motion lies more forward and thus is not removed. This proposal of Prof. Esmarch, to form a false joint in front of the cicatrix, was suggested to him by a case which came under his care in 1854, in which considerable destruction of the cheek and contraction of the cicatrix had occurred, together with immobility of the jaw and necrosis of a portion of it. The necrosis was fortunately in front of the cicatrix. The bone having been removed, it was found that mobility was restored and a useful amount of movement obtained. Mr. Mitchell Henry was the first, however, to put Esmarch's suggestion into practice, his patient, however, dying from pyæmia. Christopher Heath, F.R.C.S., has since had several successful cases, so that this operation is now an established one in surgery.

The operation suggested by Prof Esmarch is especially indicated where only one side of the jaw is affected, usually securing to the patient a useful, though one sided movement of the bone. Various modifications of this operation have since been devised and applied by different surgeons to suit special cases, and thus many persons afflicted with closure of the jaws have been relieved.

In order to give relief in cases of ankylosis due to the destructive disease of the tempero-maxillary articulation, our treatment must be directed with the aim of securing a false joint, or joints in case of double ankylosis, through some point of the ramus, and not as some operators have done in front of the masseter. This is sufficient to liberate the body of the bone so as to enable the patient to open the mouth, but the hand has to be brought into use in the act of masticating. If the immobility be due to fibrous adhesion formed between the condyle and glenoid cavity, the method as practised by Mr. Spanton of dividing the adhesions with the tenotomy knife is to be recommended. In case of rheumatoid arthritis, in which the suffering is great, as well as in cases of osseous ankylosis of the tempero-maxillary joint, excision of the condyle seems to offer the best means of giving relief. The operation through the ramus above the angle appears to me to be the most suitable in all cases of double ankylosis, not of rheumatic origin. Our aim being, in removing a small wedge of bone to establish an artificial joint ; should the result prove successful, all of the muscles of mastication excepting the external pterygoid, have their functions retained to the benefit of the patient.

Rokitansky describes the unnatural joints resulting from fracture as of two kinds, " one, more or less resembling a synarthrosis ; the other, like a diarthrosis, and accordingly, in its proper sense, a new joint. In the former case the fractured ends of the bone are held together by a ligamentous tissue ; either a disc of ligament the thickness of which may vary, is interposed between them and allows of but little movement, or as occurs when there has been loss of substance from injury, absorption of the fractured ends or otherwise—ligamentous bands connect the fragments and allow them to move freely on each other. The connecting tissue appears to be nothing more than the intermediate substance which has failed to become transformed into secondary callus, and remains in its first state. In the second cases, a ligamentous articular capsule is formed and is lined by a smooth membrane which secretes synovia. The fractured surfaces adapt themselves to each other, and become covered with a layer of tissue which is fibro-ligamentous, or more or less fibro-cartilagenous. They may articulate immediately with one another, or may have between them an intervening layer of ligament which corresponds to an articular cartilage, and their movement upon each other is more or less free according to the size of the articular capsule and the form of the articulatory surfaces. These last are sometimes horizontal and smooth. They glide over each other and allow of restricted motion ; sometimes one surface becomes convex and the other concave ; sometimes both are rounded off and lying within a capacious capsule far apart ; they come in contact only during particular movements. The articulating capsule is the product of the inflammation of the soft parts ; the cartilaginous-form layer, which covers the ends of the bone is secondary callus, arrested in its metamorphosis and converted into a fibrous tissue."

The Ohio Journal of Dental Science.

HOW GAS CYLINDERS ARE MADE.

(From the *Photographic News.*)

The industry is not exactly a new one, for carbon dioxide and nitrous oxide (the latter for the use of dentists) have been supplied in a compressed state for many years. Now, with the creation of the modern amateur photographer, who can make lantern slides, and the more general adoption of the optical lantern for the purposes of demonstration and amusement, there has arisen a demand for the limelight such as was never experienced before, and as the limelight is dependent upon the two gases, hydrogen and oxygen, for its support, these gases are now supplied in large quantities commercially. At first the gas cylinders were made of wrought iron; they were cumbrous and heavy, and the pressure of the inclosed gas was so low, that a receptacle to hold only ten feet was a most unwieldy concern. But times have changed, and a cylinder of about the same size, that half the weight, is now made to hold four times the quantity of gas at the enormous initial pressure of 1,800 pounds on every square inch. This means the pressure which an ordinary locomotive has to withstand multiplied by twelve. The change is due to improved methods of manufacture, and to the employment of mild steel of special quality, in lieu of the wrought iron previously employed. The cylinders are now made without joint or seam, and the process of manufacture is most interesting. A short time ago we had an opportunity of watching the various necessary operations involved in making these cylinders at the Birmingham works of Messrs. Taunton, Delamard & Co., by whose courtesy we were enabled to make notes of the progress.

Beginning with the raw material, we were shown a disk of metal, measuring thirty inches in diameter, and three-quarters of an inch in thickness. From such a "blank," a cylinder destined to hold 100 feet of compressed gas can be constructed, and the first operation is to heat the "blank" in the furnace, and afterwards to stamp it into cup-like form. To all intents and purposes, this represents the end of a finished cylinder, but it is far too bulky to form the end of one of the size indicated; indeed, it in reality contains enough metal to make the entire vessel. By a series of operations, it is now heated and drawn out longer and longer, while its thickness diminishes and its diameter grows less. These operations are carried out by means of a number of hydraulic rams, which regularly decrease in size. The plunger may be compared to a finger, and the cylinder to a glove, while the well may represent a hole into which both are thrust in order to reduce the thickness of the glove. With huge tongs, the cylinder, fresh from the furnace, is placed in position, but just before the plunger presses into the red hot cup, one of the workmen empties into the latter a little water, so as to partially cool the bottom, and prevents its being thrust out by the powerful plunger. Oil is also used plentifully, so that as the plunger works slowly down the red hot mass, it is surrounded by smoky flames. It presently forces the cylinder into the well, and when the end of the stroke is reached, a stop piece is inserted through an opening in the upper part of the well, so as to arrest the edge of the cylinder while the reverse action of drawing out the plunger is proceeded with. Directly the finger is drawn out of the glove—in other words, immediately the plunger is raised out of the cylinder—the latter drops down below with a heavy thud, still in a red hot condition.

This operation of hot drawing is repeated again and again in rams of diminishing size, until the cylinder assumes the diameter and length required. This hot drawing leaves the surface of the metal marked with longitudinal lines, not unlike the glacier scratches on a rock, albeit they are straighter and more regular. But the next operation not only obliterates these markings, and gives the metal a smooth surface like that of polished silver, but it also confers upon the material a homogeneity which it did not before possess, and without which it would never bear the pressure which it is destined to withstand when finished. This operation consists in a final application of the hydraulic ram while the metal remains perfectly cold, instead of red hot, as in the previous cases.

As the result of these various hydraulic operations, we have a perfectly formed cylinder closed at one end, and we now follow it into another department of the works, when its open end is once more brought in a furnace to a red heat. The object of this is to make the metal soft, while the shoulder and neck of the vessel are formed. To accomplish this, the heated open end of the cylinder is laid horizontally upon a kind of semicircular cradle, and is held there by tongs handled by two men. Another workman places over the open end a die, and while the cylinder is slowly turning around in its cradle, two sledge hammers are brought down with frequent blows upon the die, closing in the end of the cylinder, but leaving a central hole. Further operations reduce the opening still more until it is closed together, and a projection is formed. This projection is now bored through, and the cylinder is ready for testing.

The cylinder is submitted to a water test; the liquid being forced in until the gauge shows a pressure of two tons to the square inch. Cylinders have been known to give away under this ordeal, but without any dangerous consequences. The metal simply rips up, making a report at the moment of frac- as loud as a gun. The wonderful strength of the metal employed may be gauged by the circumstance that the walls of the cylinder designed to hold 100 feet of gas are only five-sixteenths of an inch in thickness.

During the manufacture of the cylinder, as we have already indicated, much oil is used, and so far as steel can be saturated with that fluid—in the popular sense—the metal is in that state. It is essential that this oil should be completely got rid of, and this is carefully done before the cylinder is charged with gas. Previous to such charging, the vessel has to be fitted with its valve. Of these valves there are three kinds; known respectively as the Brin, the Birmingham, and the Manchester. Each has its admirers, but we cannot here discuss their individual merit.

The charging of these cylinders is brought about by a powerful pump having three cylinders so arranged that the compressed contents of the first cylinder are still further compressed in the second, and still more highly in the third. The filling of a 100 ft. cylinder occupies about half an hour.

American Journal of Dental Science.

USES FOR THE OXYSULPHATE OF ZINC.

By W. D. Miller, Berlin

Dr. Miller recommends the use of Fletcher's Artificial Dentine for temporary purposes, and employs it both in his own practice, and at the Dental Institute of the University.

When mixed moderately thick it hardens quite rapidly, in fact as soon as it is in the cavity it is hard enough to under go the necessary trimming. The time required for its setting can, however, be increased *ad libitum* by mixing it sufficiently thin. Like other preparations of its kind, it rapidly deteriorates in quality if any impurities obtain access to it, or if the bottles are not kept perfectly corked.

When fully hardened it has not quite the hardness of plaster of Paris, but is a little tougher. It is practically non-irritant; a quantity of the material mixed, being taken upon the tongue, produces about the sensation of a half per cent. solution of carbolic acid.

1. For capping exposed pulps. When the pulp has been fully prepared for capping, mix a small quantity of the cement to such a consistency that, when it is taken upon the point of an excavator, it does not flow off from it but still is sufficiently thin to hang down in the shape of a minute drop. If a drop of cement of this consistency a little larger than a pin head is brought into contact with the point of exposure, it spreads itself out over the surface of the pulp, adapting itself perfectly to its irregularities and forming a much more perfect covering than can be obtained with asbestos, pieces of paper, gutta percha or any other material which cannot be applied in a semi-fluid state; besides, what is of greatest importance, it may be applied without a trace of pressure.

Those who for certain cases favour an antiseptic capping may easily produce the desired action by incorporating the antiseptic into the capping material, though some substances interfere with the hardening. As soon as the cap has hardened which requires about two minutes (more if the cement was mixed very thin), the filling may be completed.

2. In the operation of perforating or removing hard fillings from pericementitic teeth, the oxysulphate is of the greatest service. How painful if not unbearable for the patient, and how trying to the operator it is to operate upon a tooth which may be so sensitive that the slightest touch causes excruciating pain, we all know, and yet this operation made be made almost or quite painless. Dry the tooth to be operated upon as well as the adjoining tooth, on each side, with bibulous paper, then mix a large quantity of the oxysulphate, say half a thimble full, and plaster it with a broad spatula upon the lingual as well as labial surface of the three teeth, slightly pressing upon it so as to force it between the teeth. It hardens sufficiently in one or two minutes to fix the tooth immovably between the adjoining teeth. The ease with which

the operation may then be performed is often a matter of surprise both to patient and operator. In these cases plaster of Paris may take the place of oxysulphate.

3. In like manner oxysulphate or plaster of Paris may be used during the operation of filling with gold, for fixing teeth which have become loosened, no matter by what process.

4. He sometimes makes use of the oxysulphate for pressing the gums away from the cervical margin of cavities, particularly in wedge-shaped cavities where cotton cannot be made to hold. Dry the cavity thoroughly and fill it with cement mixed rather thick, and when it has begun to harden, press upon it with a pledget of cotton. The cement spreads out and forces the gums back at the margin of the cavity.

5. For enclosing applications on cotton of whatever nature he has found the oxysulphate vastly superior to gutta-percha. It is a very difficult matter to cover a pledget of cotton, well saturated with liquid, with gutta percha, particularly in a shallow cavity, but it may be very easily accomplished with oxysulphate.

6. It can be used for fixing the metallic caps over the teeth in regulating appliances where they are to remain but a short time, also for temporarily setting pivot teeth.

Dominion Dental Journal.

CRYSTAL GOLD IN DENTISTRY.

By Dr. N. W. Williams.

Crystal gold was first brought to the notice of the profession as early as 1855 or 1856. Professors George Watt, and J. Taft, invented a form of crystal gold, which they exhibited, filling a number of teeth to demonstrate its superiority over gold-foil.

This form of gold was made after what is called the mercury process, which consists in dissolving pure gold in one part of pure nitric acid to three parts of pure hydrochloric acid, and the gold precipitated by slowly adding a strong solution of sulphate of iron and letting it stand undisturbed for about twenty-four hours, when the gold may be found in the bottom of the vessel in a brown powder. The solution is carefully poured off, and the gold is poured into a flat dish and pure sulphuric acid added, sufficient to cover the gold, and allowed to stand for a few hours to get rid of any iron which may be present. Then the gold is washed with several workings of distilled boiling water till no taste of acid remains. It is then allowed to dry till all moisture disappears. It is placed with pure mercury, a little at a time, in a wedgewood mortar and ground together till it is a thick paste, when it is again washed with hot distilled water till the water remains clear. It is then placed in an evaporating dish, a steam bath, and dilute nitric acid added to cover the mass, and watched closely till all of the mercury has been driven off, which leaves the gold in crystal form. This is washed with distilled hot water till no taste of acid remains. Then the gold must be placed on a soapstone slab and put into the fire and slowly heated to redness, which drives off any impurities and anneals it, and it is then fit for use. The process being somewhat difficult and complicated, and attended with some danger to the health, the inventors were never able to make it in sufficient quantities for sale, and the profession were deprived of a very valuable aid in operative dentistry.

The crystal gold, known under the name of A. J. Watt's crystal or sponge gold, was brought out about the same time as that of Watt and Taft. At first, it was not a success, as complaints were made that it discoloured in the mouth, and did not make a perfect filling at the margins. This may have been due in part to bad manipulation, for, being very spongy, one was inclined to use it in too large pieces, and it then would harden under the instrument before it was condensed throughout the mass. The makers of this gold have steadily improved it, till now it is a very valuable gold in saving teeth.

Items of Interest.

ANTISEPTIC TOOTH POWDER.

Resorcin	30 grains.
Salol	60 "
Powdered orris	ʒ viij.
Precipitated chalk	ʒ ij.
Carmine	3 grains.
Oil of peppermint	10 drops.

Mix.

Selection.

TOOTH CULTURE.*

By Sir James Crichton-Browne, M.D.
Lord Chancellor's Visitor.

(*Concluded from page* 665).

Besides caries, there were many other dental defects noted in the weak-minded inmates of the Royal Albert Asylum. There were overcrowding and displacement of teeth in seventy-five cases, sometimes to such an extreme degree, as to produce two distinct rows of incisors in the upper jaw, the central incisors in front, and the lateral incisors behind, and this overcrowding depending upon contraction of the jaws, the upper jaw being V-shaped, semi V-shaped, or saddle-shaped, and invariably associated with narrowness and arching of the palate, was three times as frequent in girls as in boys. There were notching, pitting, and honeycombing of the teeth in eighteen cases, and these conditions were five times more frequent in boys than in girls, while in almost every case there was observed either natural absence of a tooth or teeth, delayed eruption of a tooth or teeth, dwarfing of teeth, or malformation of one or more teeth, while in a considerable number of cases, there were hypertrophy, hyperplasia, or distortion of the alveolar processes and gums. Without entering on further particulars, I would say that my limited survey of the teeth of idiots and imbeciles has convinced me that much valuable information will be derived from a systematic study of the developmental irregularities of the teeth and jaws which abound amongst them—a study which has been touched on by Cartwright, Ballard, Ireland, Langdon Down and Oakley Coles, which was seriously undertaken some years ago by your colleague, Dr. Talbot of Chicago, who did not, however, push his inquiries very far, but limited them to maxillary modifications. It is obvious, I think, that the condition of the several teeth in the weak-minded will sometimes guide to the particular point in the evolution of the nerve centres when arrest in development took place, while the distribution of caries amongst their teeth will throw light on some obscure questions in dental pathology. It is obvious that certain types o teeth are characteristic of certain varieties of mental defect, and it is possible, therefore, that certain less marked, but still perhaps distinctive dental characters are associated with certain mental qualities in those who are not weak-minded, and that dentistry might afford glimpses of insight and prescience to which palmistry has only pretended to attain. It is obvious above all that cerebral abnormalities, congenital and developmental, have associated with them dental malformations and degenerations of an exceedingly marked kind, and it is probable, therefore, that cerebral disorders in the young, when dentition is still incomplete, may impair the soundness of the teeth, and so as I have said, the nervous high tension of the age, which is so apt to induce cerebral disorder, may be a contributory cause of the increase of dental caries in these days.

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*An Address delivered at Cambridge on June 22nd, 1892.

In the fourth place, I would mention as a possible cause of the increased prevalence of dental caries amongst us the growing aggregation of our population in large towns, for this aggregation entails for old and young, higher nervous tension than country life, a greater liability to anæmia, and a low standard of health, and also to several zymotic and constitutional diseases, which not less than general reduction of health and nervous exhaustion, leave their stamp on the teeth in impaired nutrition. But more than this, the conditions of town life conduce especially to those forms of dental failure which depend on bacterial onslaughts. Wherever human population is thick on the ground, bacterial population is thick in the air, and in our crowded cities we have a crowded atmosphere, contrasting unfavourably with the pure air of the country, and conveying constantly into the mouths of men, women, and children, volumes of parasites, pathogenic and non-pathogenic. The mouth is indeed, veritably, a menagerie of tame and wild bacteria. Miller found twenty-two kinds of bacteria in the mouth, of which sixteen brought about an acid reaction, when cultivated in beef extract peptone, while four produced an alkaline solution, and only two a neutral one. Six organisms are invariably found in the human mouth, almost invariably another three or four, and during epidemics, or when there has been contact with persons suffering from various diseases, the organisms associated with these diseases and epidemics are frequently detected in the mouth, mingling with its habitual inhabitants, a fact which reminds me of the curious way in which home lore sometimes anticipates scientific discovery ; for as a boy I was instructed, and I daresay many of you were so also, always to spit vigorously for some time after passing a person supposed to be afflicted by any infectious disease, or any house where it was known to exist. The frequent presence of such organisms in the mouth as well as of others of a still more virulent type, such as that of sputum septicæmia, which is harmless until there is, from some cause set up, congestion or œdema of the lung, when it immediately induces croupous pneumonia or gangrene, or that of acute septicæmia, or such as the streptococcus aureus and albus, seems to make it incumbent on the dentist to practise thorough antiseptic cleansing of the mouth, before even trifling operations are undertaken, in town at any rate, for suppuration and symptoms of chronic poisoning and of pyæmia, have followed even the extraction of a tooth or lancing of the gums.

Whether indigenous or of occasional and foreign intrusion, the bacteria which haunt the mouth find there conditions eminently suitable to their rapid multiplication. The mouth is indeed an incubating chamber specially prepared for bacterial cultivation. In it the proper temperature is steadily kept up and the proper degree of moisture and aeration is maintained, while proper nutriment is liberally supplied in particles of food which adhere to the teeth and gums, in the desquamating epithelium, in the sugar resulting from the transformation of starch by the action of ptyalin, and in the substance of the teeth themselves. In sections of decalcified teeth stained with fuchsin and vesuvin bacteria are often seen scattered irregularly through the dentine when it is undergoing decay or softening ; and although these bacteria may be only playing a secondary part, it is to be borne in mind that it is an important part and that it has only become possible because other bacteria have taken the initiative. It is when the enamel is removed that bacterial inroads in the dentine become practicable and the removal of the enamel is effected by lactic acid and the peptonising enzyme which other bacilli produce. Miller found in his experiments on artificial decay that as long as the enamel was entire acids had no power to injure the dentine beneath, but wherever the enamel was thin or imperfectly developed the dentine was soon softened by any acid that was present and the canaliculi were then speedily filled with bacteria, which gave rise to irregular corrosion. As a large majority of the bacteria which find their way into the mouth do produce acids, it is evident that conditions that increase the bacterial supply to the mouth must promote the destruction of enamel and the invasion of the dental tubules, so that the aggregation of our people in towns must tend to the diffusion of dental caries.

There are other conditions of modern life, such as the catholic habit of smoking tobacco and the frequent administration in the treatment of debility of drugs, like the perchloride of iron and hydrochloric acid, that are rapidly destructive of enamel, which have perhaps contributed to the reign of caries that we deplore—a reign that still extends, notwithstanding an enhanced degree of attention bestowed upon the care of the teeth, as indicated by the huge increase in the manufacture and sale of tooth-brushes and tooth-pastes and powders during the last twenty years. But the principal causes of the increase of dental caries have, I believe, been summed up in what I have said to you this afternoon, and the practical question that now arises, is what can be done to remove these causes or to counteract their effects, to banish from our country a blight that has invaded every household and to secure to our people the boon of sound and serviceable teeth.

I have said that the present state of matters is deplorable. I am sure you will agree with me that it is harrowing to reflect on the pain and sleeplessness and distress that are daily due to dental caries in this country. Beyond these immediate evils accruing from it there are remote consequences which are even more grievous. Decay of the teeth implies imperfect mastication, delayed digestion, impaired assimilation, and a whole train of derangements which embitter and sometimes shorten life. It implies also imperfect articulation and therefore some social disability ; and further than this, I would affirm that it implies sometimes danger to mental health, for in a sensitive woman, especially if she is otherwise pretty, the knowledge that she has unsightly teeth, or an obviously artificial set, is just one of those minor but constantly recurring worries and chagrins that tend to upset the equilibrium of the nervous system. The prevention of dental decay, then, and the preservation of sound teeth, become hygienic and prophylactic measures of the first moment. The boy who can masticate has a much better prospect of success and happiness in life than he who can merely munch, and the girl who dares to show her teeth will have more joy in her womanhood than she who has to veil them behind an imperturbable upper lip.

What, then, are the hygienic and prophylactic measures which should be resorted to for the prevention of dental caries and the preservation of sound teeth? The most important, the most hopeful of all of them, are those which you are met to discuss this afternoon, and which have reference to the care of the teeth of children during the period of schooling. We cannot roll back the tide of evolutionary change, abolish the potato and other pulpy foods, cool down the fever of competition, or reverse the centripetal force that is drawing our labouring classes into towns; but we can do much, very much, to avert and counteract the injurious effects upon the teeth which are exerted by such movements towards more artificial modes of life; and, best of all, we can do this in early life. The reformation of the vicious and criminal classes can only be successfully carried out amongst the young; and dental delinquency is only to be efficiently dealt with—on the large scale, at any rate—amongst those of tender years. I would, perhaps, not be going too far in alleging that if universal, continuous, and skilful supervision and management of the teeth during their development and eruption—that is, up till twenty years of age—could be secured, there would be practically nothing to do to the teeth afterwards. Once safely brought through the perils of youth they might, in a vast majority of instances, be left to themselves afterwards without any fear of their degenerating, even under circumstances of trial and neglect.

It is during childhood that tooth troubles originate, and it seems to me that you are performing a great public duty, in a manner worthy of an unselfish profession, in calling attention to the alarming prevalence of dental caries amongst school children, and in asking that steps be taken to arrest its progress and prevent its spread. It seems to me that you have already made out an unanswerable case in favour of interference, and I cannot doubt that you will soon be successful in securing it. You have shown the reality and the magnitude of the evil as it exists; you have shown the practicability of dealing with it remedially, and you are entitled to insist that easily attainable protection shall be given against an evil, distressing in itself and pernicious and far-reaching in its consequences.

In the first place, I would say it is the clear and pressing duty of Government or Parliament to provide that in all public institutions for the maintenance or education of the young, whether under public control, as in the case of training ships, reformatories, industrial and workhouse schools, or under the management of committees of subscribers, as in the case of orphanages, hospitals and homes, the teeth of the children shall be periodically examined by a qualified dentist, and everything that is needful done for their preservation. The governing bodies of such institutions stand *in loco parentis* and are bound to do everything that a good and prudent parent would do to guard the children under their charge against suffering and illness and to equip them thoroughly to earn their living. Of the children in such schools a large number ought to look forward to joining the public services, and in order that they may do that it is essential that they should have sound teeth, for, as we know, a considerable percentage of young men desiring to enter the army and navy are rejected annually solely on account of dental disease.

As regards Board Schools, there would certainly be greater difficulty in introducing compulsory dentistry. There would, no doubt, be resistance by ignorant and stupid parents, and perhaps by a pig-headed society, to any operative procedure enforced to ensure to children the inestimable blessing of sound teeth, just as there is opposition to compulsory vaccination and other beneficient measures of a like kind; but, as far as I can see, there could be no objection to compulsory inspection of teeth, and it is this, I respectfully submit to you that you ought to aim at, and that, were it once fully introduced, would ultimately secure for us nearly all we want. Were statutory powers obtained, making it obligatory upon all School Boards and committees of schools receiving grants, to have the teeth of every child attending these schools examined by a qualified dentist twice a year; to forward to the parent or guardian of every child a copy of the dentist's report, indicating, wherever interference is necessary, what measures are required for the preservation of the child's teeth; and to provide at a cheap rate to parents and guardians disposed to avail themselves of it, the assistance necessary to carry out these measures, then I feel satisfied that dental caries would be immediately circumscribed in its ravages, and in a few generations become comparatively rare, The very existence of such a system would create a public opinion in favour of sound teeth, it would bring home to the people a sense of the value of tooth culture and lead to the widespread adoption of domestic precautions against dental caries, now too much neglected. In so doing it would have advantages beyond those merely relating to the teeth, for you may depend upon it, that the simple ceremonial observance of the morning and evening toothbrush, regularly performed, exalts self-respect and so has a wholesome effect upon moral character.

A system of compulsory inspection of the teeth of school children and State-aided rectification of defects in them, such as I have alluded to, would of course entail a large outlay of money, for I contemplate that the dentists employed in this public service would be adequately remunerated for their labours ; but the money would be well spent and would yield a splendid return in the increased comfort, contentment, health and vigour of our people. Rather than it should not be spent on so laudable and desirable an undertaking—and truly our school rates are already high—I would willingly see some curtailment of the curriculum which our Board Schools now offer. Nutrition, I have often said, comes before education. It is wasteful and even cruel to force education on half-starved children, and teeth, I would now assert, come before talents. It is preposterous to confer shreds of showy accomplishments on children who cannot chew their food ; and sure I am that it would be for the ultimate welfare of the country (if so be that adequate tooth culture cannot be otherwise secured) even that the grand piano in some of our London Board Schools should give place for a time to the dentist's chair. Admirable is the grand piano in its way ; it is the high altar of popular æsthetics, but Chopin and Wagner ill accord with the groans of toothache. Horrible, no doubt, in its way is the dentist's chair, excruciating are the associations that cluster round it, but a timely resort to it robs it of its terrors, and converts it into a benefactor that lifts us from purgatorial pains into paradisaical tranquility and ease. The union of teeth is a far more momentous matter than that union of hearts, of which we have heard so much lately.

Taken in its incipient stage, caries is readily extirpated and stayed, and one of the most pleasing features in your profession at the present day, if I may say so, is the anxiety you manifest to save teeth, in which it has already made serious inroads, and to sacrifice as little as possible of natural dental structure. Marvellous is your skill, but you cannot yet supply artificial teeth with the true vital polish, and firm, nice and sentient in grip like the natural organ planted in its living alveolus, and your efforts are, therefore, directed to preserving that natural organ, even when badly damaged, whenever it is practicable to do so. Extraction, which was at one time the opprobrium of your art, just as amputation was of surgery, is now comparatively rarely practised, except by old-fashioned or questionable practitioners—although it is still, I fear, too frequently resorted to by members of my profession when trespassing, as they are often obliged to do, on your domains. Blake, the artist, left us a grotesque and curious portrait of the ghost of a flea—a hideous figure covered with scaly skin of black and gold with a murderer's countenance and eager tongue whisking out of his mouth, and a cup in its clawed hands to hold the blood. I much wish he had bequeathed to us his conception of the ghost of a lost tooth, a spectre of ivory pallor and hollow visage, with quivering fangs for limbs, wormeaten, writhing in agony and waving aloft forceps and key ; and even more do I wish that such a spectre could be set to plague every dentist or doctor who has been guilty of denticide or the unnecessary extraction of a saveable tooth. But no such ill-visions, gentlemen, will affright you, for I know how scrupulously conservative you are, how loth even to confer euthanasia on a perishing stump. In conclusion, I would beg very cordially to wish you success in your efforts to secure the protection of the teeth of the young and I would exhort you to steady perseverance in these efforts, undaunted by opposition, unruffled by ridicule and undiscouraged by failure, for your cause is a good and reasonable one and it must prevail. You are a wing, an useful and honoured wing, of the great army that is giving unceasing battle to the powers of darkness, disease and death.

THYMOL TOOTH-POWDER.

Thymol ...	30 grains.	Camphor ...	60 grains.

Rub together until melted, then add—

Precipitated chalk	30 oz.	Vanillin ...	7½ grains.
Powdered soap	10 drachms.	Otto of rose ...	a sufficiency.
Saccharin ...	15 grains.		

Mix well and sift. This is a good foreign modification of a C. & D. formula.

Dental News.

THE DENTAL HOSPITAL OF LONDON.

At the Annual Distribution held at Prince's Hall, Piccadilly, on the 13th ult.

The Dean, Mr. MORTON SMALE, in presenting the annual report, referred to the various changes that had taken place in the School, and also to the education now required by the Royal Colleges before they grant the conjoint diplomas. He announced, with deep regret, the decease of two old friends and supporters of the Institution, viz : Sir Risdon Bennett, who for many years was Consulting Physician; and Mr. Samuel Cartwright, Consulting Dental Surgeon. Both these gentlemen at all times showed a keen interest in the welfare of the School, and Mr. Cartwright had been connected with it from its very beginning ; he was the first lecturer on Dental Surgery, and for many years held the important position of Treasurer. The vacancies thus caused, have been filled by able successors, and the opinion was expressed that nothing but good could result from the acceptance, by Sir Richard Quain, Bart., of the post of Consulting Physician, by Mr. Thomas Arnold Rogers, of that of Consulting Dental Surgeon, and by Mr. Robert Woodhouse, of that of Treasurer of the School. The Dean then referred to several important changes which had taken place on the staff. Messrs. Claude Rogers, Canton, L. Read, Mills, and G. Parkinson, had found it necessary to sever their *official* connection with the School during the year, but it might congratulate itself upon having secured the services of well-known gentlemen, to replace the valuable services lost, and whose reputation would reflect credit upon the Hospital. The senior staff had been strengthened by the promotion of Messrs. Hern and Matheson, both of whom were tried officers as dental surgeons and teachers. The junior staff, on the other hand, has gained the services of Messrs. Baldwin, Robbins, and H. Lloyd Williams, each in their turn distinguished students, and all with the great advantage of having had some years of experience in private practice. Drs. Buxton and Hewitt had been promoted in their position on the staff of anæsthetists, and their places filled by Messrs. Carter Braine, and Henry Davis.

In order to give greater opportunity for the students to gain operative experience, a method had been tried of allowing stopping cases to be seen by appointment in the afternoon. This experiment proved so successful, that the Committee of Management arranged to open the Hospital in all departments, and an additional Anæsthetist, Mr. Rowell, was appointed. This development of the Hospital had proved of great benefit, both to the students and patients, besides removing, to a large extent, the overcrowding that had arisen. With regard to the experiment made in the mechanical department, the restrictions placed upon the admission of patients, had entirely prevented the danger, at first feared, that unworthy cases would be admitted, whilst the students had had the experience of making and fixing dentures, so that now no professional man leaves his Hospital so well taught, by practical experience, to carry on the many departments of his profession. It should be remembered that their students actually perform with their own hands during their Hospital career, every sort of work that they would afterwards be required to do when subsequently seeking the suffrages of the public. The appointments in connection with this department were considered so valuaable that Messrs. Balding and Burt, the two House Surgeons had been reappointed at their own request. Some changes had been made in the method of awarding the Saunders Scholarship. It was now given to that Student who had gained the largest aggregate number of marks in the examinations for all the Class Prizes, the operating prize, and special *viva voce* examinations in dental anatomy, surgery, and mechanics.

The Dean afterwards spoke in favour of a full dental curriculum of five years, thus placing pupils in the provinces upon the same terms as those in large centres where hospital work was combined with a portion of the pupilage. It would, besides, be the same period as for the medical diplomas, but this suggested change could only come if the profession, as a whole, agreed to it. In conclusion, he reminded their wealthy friends that endowed scholarships, were much needed, and would often benefit the more impecunious of their students by providing the necessary instruments.

Prof. St. Geo. Mivart, after distributing the prizes, said it was naturally gratifying to be honoured with a request to address words of welcome to young men, who, by the distinctions already obtained, gave promise that they would efficiently advance the cause of science. He was uneasy, however when he reflected that he was destitute of any special knowledge of such matters as pertained to the admirable Institution in which they were all interested. After alluding to the subjects of Zoology and Philosophy, the speaker said that, in a certain familiar sense, Time and Space, the Beautiful, the True, and the Good, had all very practical relations with the Dental Hospital and School of London; and for the benefit of such persons present, who were not fully aware how great the value and importance of these Institutions were, he felt he must say something. We were civilized human beings, and civilized man with his soft food, contracted jaws, and too frequently enfeebled articulation, had great need of the dentist's art. First, as to the relation of that art with Time! We might care little for Time in the abstract, and he, the speaker, confessed that he cared absolutely nothing for it; but there was a certain portion of time about which they took a deep interest, viz., that portion of time which we distinguish as our own "life-time," and which most of us wish to stretch and prolong. The speaker had no hesitation in saying that the lives of multitudes of mankind had been shortened by impaired nutrition, resulting from dental misfortune and neglect. Not only had life been shortened, it had been rendered less happy and of less value. To the question "Is life worth living?" a reply had been given, "It all depends upon the liver." But the condition of "the liver,"—whether by that term we mean the *organ* or the *person* who lives—depended much on that Science and Art with which the Dental Hospital was concerned. Prof. Mivart recollected when speaking with a well-known man of science about the excellent results of a certain very healthy man's brain-work that the man of science replied, "It's not brain, it's stomach," by which he meant that efficient nutrition with moderate brain power, was better than a highly developed brain with very defective nutrition.

The subject of Bacteriology was next referred to, and a very able and interesting address concluded with a sketch of the History of the Dental Art, more especially with regard to those circumstances which led to the formation of the Hospital and School.

A hearty vote of thanks, proposed by Sir Edwin Saunders, was passed to the Chairman.

The following was the list of Prize Winners:—

Saunders Scholar, Mr. G. Northcroft. 2nd Prize, Certificate and £5 (this year only), Mr. H. W. Trewby. Ash's Prize (given by Messrs. Ash & Sons) Mr. H. J. Stevens.

Class Prizes, Winter Session, 1891—92 :—

Dental Metallurgy—1st prize, Mr. H. J. Stevens. 2nd prize, Mr. C. S. Reed. Certificates of Honour—Messrs. H. W. Trewby, D. P. Gabell, G. Northcroft, S. H. Hayward, and A. Curling Hope

Dental Mechanics—1st prize, Mr. E. H. Harwood. 2nd prizes, Messrs. S. H. Hayward and E. Moseley. Certificates of Honour, Messrs. H. W. Trewby, R. S. Parris, J. G. Ranken.

Operating Prize—1st prize, Mr. T. H. Clarence. 2nd prize, Mr. G. Northcroft. Certificates of Honour, Messrs. A. H. B. Farebrother and J. T. Hankey.

Class Prizes, Summer Session, 1892 :—

Dental Anatomy—1st prize, Mr. H. W. Trewby. 2nd prize, Mr. E. Mosely. Certificates of Honour, Messrs. D. P. Gabell, H. J. Stevens, G. Northcroft.

Dental Surgery—1st prize, Mr. H. J. Stevens. 2nd prize, Mr. F. Fouraker. Certificates of Honour, Messrs. J. W. Tomlinson, H. W. Trewby, E. Moseley, H. H. Ham, G. Northcroft, and A. B. Densham.

Students' Society Prize—Mr. S. H. Hayward.

An excellent programme of music by a quartette party, and recitations by Mrs. Crowe and Mr. George Giddens followed the distribution of prizes.

THE DENTAL ASSOCIATION OF NEW SOUTH WALES.

The Committee appointed at a General Meeting of Dentists held on May 10th, 1892, have unanimously agreed to recommend certain Articles of Association. These contain an enumeration of the usual objects and for the purposes of registration the Association is declared to consist of fifty members. The affairs of the Association are to be conducted by a Council consisting of a President, two Vice-Presidents, a Treasurer, Secretary, and a committee of seven to be elected at the annual meeting. When the number nominated is greater than the number of vacancies, a poll is to be taken, and the secretary is to sign and number the voting papers and send one in an unfastened envelope to each member twenty-one days before the election, and the paper is to be signed in the presence of a J.P. At the proper time the Secretary opens the envelopes returned to him, in the presence of two scrutineers appointed by the meeting. The Council is to meet at least once a month, and appears to have very full powers, such as to establish and maintain dental hospitals, schools, libraries, laboratories, and museums, to publish a Journal, and to petition Parliament in the name of the Association. It is proposed to institute an entrance fee of one guinea and an annual subscription of two, with the option of becoming a life member upon a payment of ten guineas. A special order of Associates is provided for, all registered dental students who are articled to members of the Association being eligible. They are not entitled, however, to hold office or take part or vote at any general meeting of the Association. The Council may elect as Honorary and Corresponding Members such scientific men as have distinguished themselves in any of the branches of knowledge embraced in the educational objects of the Association or who have aided and advanced any of the objects of the Association.

MELTING AND ROLLING GOLD.

In melting gold, charcoal, gasoline or illuminating gas, are the best fuels. Coal should not be employed, as the gases from it make the gold brittle. There is nothing better than the Fletcher furnaces, which are heated by common illuminating gas. The gold or alloy should be put in the crucible, and a little borax added. Do not employ the great quantity that is too frequently used. The ingot mould should be warmed, but not heated. When the gold is melted, turn it into the ingot mould and let it cool. If the amount is considerable, it should then be broken into as small fragments as practicable, and melted over again, without borax. When fairly melted, add for every four ounces a piece of saltpeter the size of a pea or a teaspoonful of sal-ammoniac and charcoal. Cover for a couple of moments and then pour.

A great deal depends upon the way in which gold is rolled. *The American Jeweller* says that unless a heavy strain be put upon it the first and second times passing, it will stretch the gold on the surface, while the middle portions not being pressed will retain the granulations of the melting process, and the gold will crack. A heavy strain at first imparts the right grain to it all the way through.

When the ingot has been rolled to about twice its length, if it be as fine as 18K. it should be annealed. If it be an alloy less fine, it should be annealed sooner. It should not be quenched until it has become black, or it will be likely to split or seam.

The Dental Practitioner.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

PERIODONTITIS.

To the Editor of the "British Journal of Dental Science."

SIR,—I daresay many besides myself would be glad of any hints as to the treatment of the above trouble. During the last two months, I have had a great number of cases, which looked to me like an epidemic of periodontitis. It attacks the young and the old, and the treatment has been very unsatisfactory. At the very onset, I find a drastic purgative answering best, such as calomel followed by a saline cathartic, a seidlitz powder, or Epsom salts; in adults of robust build, I invariably give a croton oil pill, instead of the calomel. The supposed specific remedies I find of very little value, opium answering much better in any hands than Gelsemium or Butyl Chloral; the latter drug I found of very little value unless given in large doses. Opium or Morphine I found the best sedatives, Bromide of Potassium acting well in some neurotic patients. An anti-rheumatic treatment I found the best, but even this of very little use in most cases. I think dentists, as a rule, transfer these cases to medical men, which are certainly more in the dentists' province to treat, than for the medical fraternity. I should like to hear what is the experience of others with this trouble.

Yours &c.,

D.D.S.

[Assuming our correspondent refers to *general* periodontitis, we question the suggestion that such cases can be better treated by a dentist, than by the family medical practitioner, who understands the patient's constitutional history, especially if the course of treatment may involve the internal administration of drugs like croton oil and morphia. [*Ed.*]

MOUTH-GAG.

To the Editor of the "British Journal of Dental Science."

SIR,—Would any of your readers be good enough to give their experience as to the best *Gag* to use for extraction during Chloroform, or Ether anæsthesia

DENT.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Strert, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.

2. We cannot undertake to return communications unless the necessary postage stamps are forwarded.

3. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.

4. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
5. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.

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ON THE ANÆSTHETIC EFFECTS OF NITROUS OXIDE, WHEN ADMINISTERED WITH OXYGEN AT ORDINARY ATMOSPHERIC PRESSURES: WITH REMARKS ON 800 CASES.

By Feederic Hewitt, M.A., M.D. Cantab.

Instructor in, and Lecturer on, Anæsthetics at the London Hospital; Joint Administrator of Anæsthetics at Charing Cross Hospital; Anæsthetist at the Dental Hospital of London, and at the National Orthopædic Hospital.

A.—Preliminary Considerations.

Mr. President and Gentlemen,—When nitrous oxide, free from all oxygen, is administered to a patient by means of an acurately fitting apparatus possessing two efficient valves, so that, at each inspiration, nothing but the pure gas is breathed, and each expiration escapes into the surrounding air, certain phenomena, with which you are all familiar, make their appearance. In some cases, these phenomena are very rapidly developed; whilst in others, a greater tolerance of the gas is observable, and a longer inhalation is necessary for their production. Now in order that I may make my subsequent remarks clear, I must ask you to picture to yourselves an average patient, fully under the influence of nitrous oxide administered as above described ; and to briefly consider with me the chief symptoms displayed by such a patient during the two or three seconds immediately preceding the removal of the face-piece for the performance of a dental operation. I am fully aware that different administrators carry the inhalation of nitrous oxide to somewhat different points. I do not ask you, however, to picture to yourselves a patient who has received an unnecessarily large dose of the gas, but one to whom the usual quantity has been given.

It is taught by our leading anæsthetists, and I venture to agree with them, that for dental operations, nitrous oxide should be administered till the so-called "stertor," is produced, or till some twitching in the extremities is observed. Now, in examining the phenomena of a patient at the juncture to which I have alluded, we shall, in the first place, be struck by the peculiarity of his respiration. During the earlier stages of the inhalation, the breathing, although deeper and quicker than normal, will have been performed regularly, and in most cases without snoring or other sounds. But it will now be noticed to be irregular, jerky, or even tumultuous, and to possess a characteristic and irregular sound of a guttural or of a snorting character. The irregularity in the respiratory movements, has, I believe, as its immediate cause, one or other of two conditions. It is either due to spasmodic elevations and depressions of the larynx, so that the superior aperture of this organ comes at short intervals into contact with the epiglottis and base of the tongue, or to irregular spasm of thoracic and abdominal muscles. The guttural sound, which indicates that the full effects of the gas have been produced, is doubtless due to the former of these two conditions. To this sound, the term "stertor" is often applied, but as it is not a snoring sound, the name is hardly appropriate. Snoring sounds may, of course, be present, in which case they are liable to mask the deeper and more characteristic guttural sound. Loud irregular snorting is sometimes met with, more especially if the gas has been pushed very freely—perhaps a trifle too freely. At the acme of the respiratory changes alluded to the pulse will be found to be considerably increased in rate. Although it is frequently taught that slowing of cardiac rate occurs during gas administration, experience leads me to an opposite view. I find that it is more common for the initial acceleration (from mental excitement) to persist, and in many cases to increase, and that slowing of the pulse rate does not occur till air is admitted, when an abrupt fall in rate is almost invariably to be detected. At or about the same moment at which these respiratory and circulatory phenomena appear, it will usually be noticed that the patient exhibits evidences of irregular clonic muscular spasm in the peripheral parts of the body. To those clonic muscular twitchings, the term "jactitation" is often applied. The face, the fingers, the arms, the legs, and even the trunk itself may share in the clonus. Micturition not infrequently occurs, more especially in children, during these jerky movements. Children are particularly prone to exhibit the muscular phenomena here referred to; and, as every dental surgeon will know, such movements may occasionally interfere with the efficient performance of the operation. Clonic movements are often followed or accompanied by tonic, and a state of opisthotonos may be induced. Although anæmic patients, like children, are very susceptible to the action of nitrous oxide, and quickly exhibit the respiratory and muscular phenomena described, florid and vigorous persons may unexpectedly, though rarely, prove equally susceptible subjects. I shall have occasion to refer to a healthy and florid female patient, who, after from twelve to fifteen breaths of nitrous oxide, immediately exhibits the so-called "stertor" and "jactitation" in a very marked and inconvenient degree. In addition to the respiratory and muscular symptoms which follow the free use of undiluted nitrous oxide, there is always some change in the natural colour, and the features assume a dusky, livid, or even a cyanotic aspect. The altered colour is always most noticeable in ruddy faced or plethoric patients, and is greatest at the acme of the administration, *i.e.*, at the juncture we are considering, and when respiratory rhythm is most interfered with. Those patients who are very susceptible to nitrous oxide and quickly display jerky respiration and muscular movement, will also quickly display lividity, the intensity varying with the previous colour. Dilatation of the pupils is nearly always present when a full dose of nitrous oxide has been administered, the degree of dilatation varying in different cases. A maximum dilatation is very common at the height of the changes in respiration already described. Lastly, the tongue and adjacent mucous membranes become dark, engorged, and swollen, when the administration of the gas is carried to the point which has been indicated.

Nitrous oxide has proved such an excellent anæsthetic in dental surgery that it seems almost ungracious to draw attention to the few and comparatively unimportant disadvantages which are connected with its employment. Its great safety, its rapidity of action, and its remarkable freedom from after effects, all combine to render it superior to other anæsthetics for brief operations. But like every other therapeutic agent it has its drawbacks; and it is with the object of lessening or removing these that the admixture of oxygen with nitrous oxide has been suggested. If we can obtain nitrous oxide anæsthesia without the occurrence of "stertor," "jactitation," and lividity, so much the better. Now, without entering at length into any physiological details I may say, and I think without fear of contradiction, that by the addition of a comparatively small proportion of oxygen to nitrous oxide the three symptoms mentioned may be more or less completely prevented without interfering with the anæsthetic effects of the nitrous oxide. I am aware that this Society has lately had before it a very able and thoughtful paper by Dr. Dudley Buxton, in which he has attempted to show that nitrous oxide administered in a proper manner produces no asphyxial phenomena—that the latter only supervene when the agent is unduly pressed. I will not, therefore, reopen any discussion on this point. All I state is this, that the three phenomena referred to—which are, to a greater or less degree, essential to success in ordinary nitrous oxide administration in dental practice—do not appear when oxygen is used with nitrous oxide. And let me remind the Society that these three symptoms do appear and in a very marked degree when pure nitrogen is inhaled. At the instigation of Sir George Johnson, Mr. Braine and I administered nitrogen, not only practically free from oxygen but with known and small percentages of this gas, to several patients at the Dental Hospital of London; and the phenomena were to the by-standers indistinguishable from those of an ordinary nitrous oxide administration. No one can, I think, deny that the " stertor," "jactitation," and lividity produced by nitrogen are of asphyxial origin. The interesting and significant results which we obtained have already been published in the medical journals.

Ordinary atmospheric air, when mixed in sufficient proportion with nitrous oxide, will prevent the three phenomena under consideration, but is not nearly so suitable as oxygen itself for this purpose. In nitrous oxide mixed with air, we have to consider two factors: (1) the anæsthetic, and (2) the oxygenating factor. In the case of patients requiring large doses of nitrous oxide, it is not possible to have the oxygenating factor present to any great extent, otherwise intoxication rather than quiet anæsthesia results. But in weakly and fragile subjects the oxygenating factor may be present to a greater extent, and the proportion of the nitrous oxide may still be sufficient to produce tranquil anæsthesia. I have often anæsthetised children and others with nitrous oxide and air, without producing, save perhaps in a minor degree, "stertor," "jactitation," or cyanosis. The unsuitability of atmospheric air as an oxygenating agent is due to its useless nitrogen. If we administer with nitrous oxide a percentage of air capable of preventing the three symptoms, we shall, in most cases, also prevent deep anæsthesia, owing to the too small percentage of nitrous oxide in such a mixture. For example, a mixture of 50 per cent. of air and 50 per cent. of nitrous oxide would contain about 10 per cent. of oxygen and about 40 per cent. of nitrogen; and although the 10 per cent. of oxygen might be sufficient to prevent marked cyanosis, "stertor," and clonic muscular spasm, the 50 per cent. of nitrous oxide would probably be insufficient to produce tranquil anæsthesia. If, however, instead of using air for oxygenating purposes we employ oxygen, we shall be able to replace the 40 per cent. of useless nitrogen by a corresponding quantity of useful nitrous oxide; and the proportion of the latter will now rise to 90 per cent. With such a large percentage of nitrous oxide anæsthesia is almost certain to become established, and the percentage of oxygen remaining the same as in the nitrous oxide and air mixture, "stertor," "jactitation," and other evidences of extremely deficient blood oxygenation will be prevented.

Perfectly pure nitrous oxide, administered as described at the commencement of this paper, is only respirable for a brief space of time. When the phenomena to which I have referred make their appearance the inhalation must be discontinued, and oxygen, in some way or another, admitted to the lungs. It is this want of available oxygen which makes pure nitrous oxide an irrespirable gas, save for a very short period. Should the administration be persisted in respiration would come to a standstill, and the standstill, in most cases, would have as its immediate cause spasm rather than paralysis of muscles directly or indirectly concerned in the performance of respiration. When nitrous oxide is administered in such a manner that the air originally present in the lungs is not removed as rapidly as has been indicated (as for example, when a facepiece with but one valve is employed, or a so-called supplemental bag is used), a longer time is taken for the production of the respiratory changes described. A similar increase in the period of inhalation may be secured by allowing a small percentage of air to become admixed with the gas. Too much air would, of course, reduce the anæsthetic properties to a minimum, and give rise to intoxicating but not anæsthetic effects. But the best plan to render nitrous oxide respirable is to administer it with oxygen, as will be presently described.

In administering anæsthetics for dental operations, one is frequently struck by the fact that the available period of anæsthesia, after removing the agent employed, is, to a great extent, dependent upon the length of inhalation. Now, as we have seen, this period of inhalation is, in the case of undiluted nitrous oxide, often very short ; and the resulting anæsthesia is often correspondingly transient. I am well aware that exceptional cases occur, and that by administering the gas in such a way that a short period of re-breathing is allowed towards the close of the administration, a longer anæsthesia than usual may be produced. But by the use of oxygen with nitrous oxide we present the anæsthetic to the patient in a respirable form. Large volumes of the gas can thus be thrown into the patient's circulation—far larger quantities than one can administer in the absence of oxygen—and thus the resulting period of anæsthesia becomes appreciably prolonged. It may be said indeed, but more especially with regard to exceptional cases, that nitrous oxide does not have a fair chance, when administered in the absence of oxygen, of producing its anæsthetic effects ; for at or about the moment of commencing true anæsthesia, symptoms dependent upon oxygen-starvation assert themselves, and the inhalation has to be stopped.

There is yet another important advantage in the employment of oxygen with nitrous oxide. Although the use of the latter gas, administered in the ordinary manner, is, as you well know, practically free from risk to life, every one who has had a large experience with it must have met with exceptional cases in which threatening symptoms have arisen. Without entering more fully into this part of the subject, there is every reason to believe that when such symptoms do arise, they are dependent upon the want of oxygen. Obstructed, shallow, or arrested breathing, cardiac depression, &c., will be far less likely to occur when oxygen is used with nitrous oxide.

B.—EARLIER ATTEMPTS TO PRODUCE SATISFACTORY ANÆSTHESIA FROM NITROUS OXIDE IN THE PRESENCE OF OXYGEN.

The late Paul Bert was the first to attempt to secure tranquil anæsthesia from nitrous oxide in the presence of oxygen. After numerous experiments, he arrived at the conclusion that an increase in the ordinary atmospheric pressure was necessary in order to obtain good results. He regarded nitrous oxide as an agent which, at normal pressures, could only produce anæsthesia when administered by itself, that is, free from all other gases. He, therefore, contended that, in order to obtain the anæsthetic effects of nitrous oxide in the presence of oxygen, it was necessary to administer the mixed gases under an increased pressure, in order that the blood might take up more of the nitrous oxide than would be possible in any such mixture administered at ordinary pressures. Specially constructed chambers, in which the atmospheric pressure could be raised, were made. Time will not permit me to describe them or the details of Bert's ingenious and successful process. The results, so far as the anæsthesia was concerned, were in the highest degree satisfactory. Not only was there an absence of all asphyxial phenomena, but the addition of the oxygen rendered the nitrous oxide so respirable, that a continuous administration was possible, and surgical operations of considerable duration and magnitude were performed. But owing to the costliness of the apparatus, to its being cumbrous and somewhat complicated, and to the discomfort experienced by the operator and his assistants by reason of the increased pressure to which they were necessarily subjected, Bert's chamber is now very rarely employed.

Bert's results were so remarkable, that attempts were subsequently made to secure equally satisfactory effects without the employment of the increased atmospheric pressure which Bert had regarded as essential. Klikowitch appears to have been the first to succeed in this direction ; Zweifel soon followed ; and Hillischer has lately recorded a large number of cases to which I shall subsequently allude. The last-named observer has given the name "Schlafgas" (sleep-gas) to the mixture, in consequence of the sleep-like condition which it produces.

C.—An account of 805 Administrations of Nitrous Oxide and Oxygen conducted at ordinary atmospheric pressures.

In 1886, having been informed by Mr. Cunningham of the attempts which where being made in Germany to obtain satisfactory anæsthesia from nitrous oxide and oxygen, without employing an increased pressure, I commenced a series of experimental administrations. Up to the time at which I am writing (June 6th, 1892,) I have administered oxygen with nitrous oxide in 805 cases, and with your permission I will relate, as briefly as I can, the various plans which I have tried and the results which I have obtained.

Series 1 (21 *Cases*).

The so-called "supplemental-bag" of an ordinary nitrous oxide apparatus was filled with 20 per cent. of oxygen and 80 per cent. of nitrous oxide. When the full effects of nitrous oxide had been induced, the tap of the "supplemental-bag" was turned and the oxygen mixture was respired. The tumultuous respiration, "stertor," and "jactitation," of nitrous oxide quickly subsided as this was done. The results, however, were not satisfactory.

Series 2 (7 *Cases*).

A small bag filled with oxygen was interposed between the face-piece and the nitrous oxide bag, and by means of a three-way regulating tap I was enabled to divert any desired proportion of the inspired nitrous oxide current through the oxygen bag on its way to the patient. The results, however, were equally unsatisfactory.

Series 3 (16 *Cases*).

Nitrous oxide and oxygen were mixed in varying proportions in an ordinary gasometer, and a chemical analysis was made of the mixture which answered best. The analysis showed a percentage of 12.77 of oxygen.

Series 4 (121 *Cases*).

A mixture containing 12½ per cent. of oxygen with nitrous oxide was administered from an ordinary gasometer. In all these cases the natural colour was preserved, the so-called "stertor" and "jactitation" were completely absent, and the mixture could be respired continuously without difficulty. Good and tranquil anæsthesia occurred in most cases, but in a certain number an undesirable degree of excited movement, screaming, &c., were met with rather early in the administration; so that the percentage of nitrous oxide in the gasometer had to be quickly increased. In two or three cases I completely failed to secure quiet anæsthesia. The average period of inhalation was 126 seconds; the average available anæsthesia was 44 seconds; and the average quantity of the mixture used was 8¾ gallons.

Series 5 (11 *Cases.*)

I now had made a regulating apparatus consisting of a mixing cylinder supplied from two bags. The cylinder had a dial and indicator, and the orifices leading from the bags could be opened to any desired extent. The apparatus, however, did not work well, and the results were not good.

Series 6 (13 *Cases.*)

I next tried two india-rubber bags, one for nitrous oxide, the other for oxygen, and made according to accurate measurements to contain, when full, the two gases in the proportion which I now believe would answer best, viz., that of 90 per cent. of nitrous oxide and 10 per cent. of oxygen. The bags were filled with their respective gases, the stop-cock connecting them was opened, the oxygen thrown into the nitrous oxide, and the mixture was then administered. I found that this plan answered well if pressure was exerted upon the bags during the administration, but not otherwise.

Series 7 (14 *Cases*).

I therefore next devised an oblong dry gasometer, and weighted it during the administration. It had mackintosh sides, and measuring rods at each end. It was not successful, as it did not work freely.

Series 8 (131 *Cases*).

I, therefore, next tried a circular dry gasometer, with a central vertical measuring and steadying rod, and weights as before, and found that it answered very well. With this apparatus, one could easily prepare the proportion of oxygen required. It had an arrangement by which the percentage of nitrous oxide in the gasometer could be increased, or, if deemed advisable, nitrous oxide *per se* could at any moment be administered instead of the mixture. I was gradually finding out the fact that patients varied considerably in the percentage of oxygen which was requisite. The large majority of these cases were successful, but in several I had to have recourse to pure nitrous oxide.

Series 9 (29 *Cases*).

Wishing to find an explanation of the much better effects which were obtained when the mixed gases were administered from a distended bag, and thinking that such effects might possibly be due to the mixture of the gases being forced, as it were, into the pulmonary passages, I next made a series of experiments, in which I controlled the free action of the expiratory valve by weighting it, thus decreasing the freedom of expiration. The results were, however, of a negative character.

Series 10 (67 *Cases*).

I next had made a wedge-shaped reservoir to rest upon the ground, and capable of holding about twelve gallons. A long wide tube led from the thin end of the wedge-shaped reservoir to the bag and face-piece. The inhaling bag was one-tenth the capacity of the reservoir, so that it was first filled with oxygen and then nitrous oxide added till the whole apparatus was charged. The foot of the administrator kept up slight pressure upon the reservoir during the administration. I still found 10 per cent. of oxygen gave good results ; it answered in nearly every case. When I met with a patient in whom this proportion of oxygen proved too high, it was easy to add more nitrous oxide ; and so every case could be terminated successfully.

Series 11 (88 *Cases*).

Still aiming at greater portability, I next had constructed for me a regulating apparatus, somewhat similar to that which I had tried some years previously. Two india rubber bags were kept supplied with the two gases, and the tubes leading from the bags joined at a regulating tap and dial, so that, as one tube was more or less opened the other was more or less closed. I found I had to employ as many as four flap valves in this apparatus in order to make it efficient. There was a dfficulty, however, in admitting the oxygen in very small quantities at a time. There is precisely this objection to the apparatus used by Dr. Hillisher. The oxygen inlet does not admit of fine enough sub-division—in other words, by a very slight movement of the indicator too great an increase or decrease in oxygen is effected.

Series 12 (125 *Cases*).

I overcame the difficulty last mentioned, to a great extent, by making the oxygen come up through small holes, any number of which could be opened or closed at a time. Of the 125 administrations thus conducted 119 were in dental practice. An analysis of these 119 gives the following results :—

(1) *Sex* : 84 females, 32 males, 3 not stated.

(2) *Age* : oldest patient 59 years, youngest 13 years.

(3) With regard to the *general result*. Deducting 4 cases of which the notes are imperfect, 115 cases remain ; of these 79 (or 68.7 per cent.) are described as typical, *i.e.*, they displayed good colour, no "jactitation" or "stertor," more or less complete muscular relaxation and quietude during operation.

(4) Of the 36 atypical cases, 9 were typical except for rigidity ; 7 were very good, but in some respect or another not quite typical ; 1 was typical except for some excitement ;

6 were only moderately successful; and 7 were terminated with symptoms of ordinary nitrous oxide narcosis.

(5) *Period of inhalation.*—This was taken accurately by the métronome in 46 cases. The average was 116.2 seconds.

(6) *Available period of resulting anæsthesia.*—This was taken in 45 cases by the métronome. The average worked out at 42.6 seconds.

From the above analysis it is clear that the results were not as satisfactory as could be wished, for although no failure to produce unconsciousness to pain occurred, several cases were only partially successful so far as a quiet anæsthesia was conconcerned, and in as many as seven instances the administration was terminated by means of pure nitrous oxide. In many of the earlier administrations with this apparatus I gave a certain number of breaths of the pure gas and then admitted oxygen in increasing quantities. I subsequently found, however, that this plan was not nearly so satisfactory as that adopted later, viz., commencing with a small percentage of oxygen and gradually increasing it. I also found that although this apparatus answered much better than all its predecessors, it yet allowed rather too much oxygen to come through as each hole was turned on. By a series of experiments I found, for example, that when five holes were open, as much as 13 per cent. of oxygen was breathed.

(To be concluded).

PERFECT TOOTH-WASH.

Soap Shavings (white Castile)	320 grains
Oil of peppermint ...	12 drops
,, lemon	12 ,,
,, cassia	8 ,,
,, cloves	8 ,,
,, anise	16 ,,
Oil of wintergreen ...	24 drops
Jockey club	24 ,,
Carmine, No. 40 ...	$\frac{1}{2}$ grain
Ammonia solution ...	4 drops
S.V.R.	8 oz.
Water	8 oz.

Macerate the soap in the water until soft, dissolve the oils and extracts.

EXCISION OF DENTAL CYSTS, *versus* INCISION AND DRAINAGE.*

By A. PEARCE GOULD, M.S., F.R.C.S.

THE treatment of cysts in various parts of the body has undergone considerable development during the last two decades, and I am anxious to submit to the members of this Society reasons why the cysts in which they are peculiarly interested—simple periosteal and dentigerous cysts—should be treated in accordance with the same general principle that is observed by surgeons in other regions. Cysts in general have been treated by tapping, by injection of iodine, perchloride of iron, carbolic acid, and other irritating fluids; by incision and drainage; by incision and stuffing of the cavity with lint—plain, or soaked in a strong solution of chloride of zinc—and by excision. All experience shows that only one of these methods of treatment—excision—is certainly and speedily successful. The injection of irritants may, on the one hand, fail to destroy the secreting lining of the cyst, and the fluid may be reproduced, or, on the other hand, it may excite a too severe inflammation in and around the cyst wall, and so lead to serious and extensive suppuration. No surgeon employs injection for a cyst without a vivid sense of the uncertainties that attend its use. Incision and drainage is a very slow means of cure; the cyst wall is apt to go on secreting its usual fluid, and a sinus remains for weeks or months. The same may be said for incision and stuffing; it may fail to cure, owing to some small portion of the secreting surface escaping the pressure of the stuffing. Excision has, therefore, become the one recognized means of treating cysts in all cases except those in which some special indications to the contrary are present. For example, an universally adherent ovarian cyst may have to be opened and drained, a thyroid cyst is opened and stuffed, in each case because of the impracticable or highly dangerous character of the operation of excision.

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* Communicated to the Odontological Society of Great Britain.

We have all experienced the tedious repair of simple periosteal dental cysts when opened and drained or stuffed ; such cavities often go on discharging for many weeks or months. This is due not only to their secreting lining membrane, but to the unyielding nature of their walls, and in many cases, also, of the tissues surrounding them. I can see no reason why such cysts should not be excised, and I would record an instance in which I pursued this treatment with marked benefit to the patient.

Miss E. F., aged 40, came to me in March last at Middlesex Hospital, on account of a swelling in the cheek. This had been first noticed about twenty months previously, when it seemed about the size of a pea ; it enlarged slowly up to July, 1891, since then it has grown rapidly. I found an ovoid, tense fluctuating swelling, the size of a pigeon's egg, filling up the right canine fossa and projecting over the alveoli of the first bicuspid and third molar. Parchment crackling of the cyst-wall was easily obtained. There was no alteration of the orbit, nose or palate. The right upper bicuspid teeth had been lost, and the first molar was decayed level with the gum.

On March 9th, chloroform was administered, and I first extracted the stump of the first right upper molar. This was followed by a gush from the cyst of glairy fluid, rich in cholesterine. The mucous membrane over the cyst was cut through, and with a raspatory the cyst was enucleated from the tissues in which it lay. This was by no means difficult.

The cyst appeared to have bulged into and to have filled the entire antrum. There were no teeth in it.

Four days later (March 14th,) the patient left the hospital. She came up to see me a fortnight later. The cavity was then much reduced in size, and *all* external signs of it had disappeared. She paid her final visit in another two weeks, when I found the cavity almost obliterated—it was no larger than a pea. Here, then, was a large cyst, as big as a hen's egg, cured by a trifling operation in three weeks. I am aware that this case illustrates but a small practical point, but any measure that shortens our patient's convalescence, even from simple troubles, is of value and of importance. I shall certainly continue to practise this operation rather than that of incision and drainage or stuffing, and, if occasion arises, employ it also in the more important class of dentigerous cysts.

CORROSIVE-SUBLIMATE LOTION.

For keeping this lotion clear, Mr. Adolph Levy has revived the old suggestion of adding 5 parts of tartaric acid to each part of the sublimate. Compressed tablets containing the ingredients in these preparations may be coloured with a harmless pigment to guard against their careless use. They are instantly soluble in warm water. Gauze, thoroughly sterilised, after being washed and ironed and immersed in the solution of the strength of 1 to 1,000, retained its activity in moist condition for over one year. The tartaric acid acts as a mordant to fasten the medicinal agents to the fibre.

British Journal of Dental Science.

LONDON, AUG. 15th, 1892.

EXPERIMENTS ON ANIMALS.

THAT Man, as a species, is a selfish animal may perhaps be admitted, but this is a poor argument to use as against the individual when objecting to the methods of those scientific men who, in the search after Truth, find themselves compelled to carry on observations as to normal and abnormal functions presented in the lower animals. It is, also, too much to suppose that any single individual amongst this band of workers is actuated by the desire of deriving knowledge from animals for the purpose of prolonging his own individual life. The question as to the justification for such experiments would seem to turn upon the point as to whether one division of the animal world is to make use of another division in the struggle for existence. If it be granted that it is right to assist in any advance being made towards the securing of immunity from the attacks of some of the lowest forms of life upon the collection of cells known as the human body, it is difficult to see how this result can be brought about except by carefully designed experiments upon animals, equally carefully carried out. But perhaps some of the short-sighted, conscientious, people who rave against the "horrors of vivisection" think that the rules in the struggle for existence, which seem to be laid down in the Biological world, apply only in such well marked instances as we find exemplified in the Carnivora preying upon the Herbivora. They must, we imagine, be prepared to argue that Man is not to maintain, and perhaps strengthen, his position at the head of the animal kingdom if such is to be gained by climbing over the bodies of those lower down in the scale. They should likewise logically hold that such conduct could never have been any part of a beneficent scheme of life whether amongst Carnivora or Primates. Is there reason to suppose that such rules only cease when we come to consider the most highly developed species in Mammalia? Indeed, in answer, we know of no reason for abstaining from the retort that Man is evidently intended to make such use of his powers, and that to omit to profit by his opportunities would be a non-fulfilment of his duty towards the future Race. Anti-vivisectionists who patronise the butcher should at least whisper their complaints, whilst for those who declare that should illness seize them they would decline to avail themselves of any remedies chosen in consequence of their proved usefulness by animal experiments, the list assumes such proportions as to leave little for such martyrs to conscience, except to follow the tenets of the "peculiar people." This seems the strongest ground to take, for if objectors are not open to argument on this point it is useless to refer to benefits derived "accidentally," so to speak, when the experiment has been carried out more for the furtherance of general knowledge than for its direct application to the healing Art. It is not to be expected that such people would willingly recognize, for instance, the number of lives and limbs saved by the discovery of a new treatment for aneurysm, derived from a study undertaken to ascertain the mode of growth in the antler of the stag.

At the recent meeting of the British Medical Association, in Nottingham, a resolution was unanimously passed recording the opinion that the continuance and extension of experiments on animals is essential to the progress of knowledge, the relief of suffering, and the saving of life. This was proposed by Mr. Jonathan Hutchinson, than whom it is difficult to imagine a more suitable speaker on such an occasion. He pointed out that those present claimed to be humane men, members of a humane profession, abhoring and detesting every form of cruelty, and that to call practices "cruel" which have for their reasonable aim the saving of life and the mitigation of suffering was an abuse of terms. With regard to the forthcoming discussion at the Church Congress upon vivisection, Mr. Hutchinson, whilst glad that the clergy should seek to form sound opinions, thought that they should be content to take the recorded verdict of scientific men.

It is sincerely to be hoped that the Public will not be led astray by attempts which are being made to interfere with the regulations now enforced by the State. The enquiry by the Royal Commision of 1875 should prove a sufficient answer for those who urge a change in the present condition of things, and as people become more enlightened they will find that the benefits derived are secured with the minimum amount of pain, and will consider that the publication of investigators' names in a would-be black list will reflect honour and not obloquy. The time will come when there will be a general recognition that such men are to be regarded as benefactors not only to the Human Race but also to the lower animals. Meanwhile it is only necessary to refer to the results promised in Bacteriology alone, without referring to the other instances where good has been derived from the building up of facts in Biological research.

> "And say, O Science, shall thy life-blood freeze
> When fluttering folly flaps on walls like these?"

THE BRITISH MEDICAL ASSOCIATION AT NOTTINGHAM.—In the section of Pathology, Professor Victor Horsley, who presided, based his introductory remarks upon the fact that too little attention is paid to the study of disordered function, in contradistinction to that of diseased structure. Whilst recognising the value of morbid anatomy, it was pointed out that this did not constitute pathology in the true sense. Prof. Horsley had no hesitation in ascribing this indifference to the want of familiarity with modern progress in physiological and chemical research. Dr. Brookhouse in the section of Pharmacology gave an interesting account of a method which he has found of great value in the treatment of pulmonary phthisis. It consists in the introduction once or twice daily, into the trachea, of one drachm of a 12 per cent. solution of pure menthol in pure olive oil. The laryngoscope is used, and also a syringe with a curved tube which is passed through the rima glottidis about half-an-inch down the trachea. It is said that the patient soon becomes accustomed to this manipulation, and experiences an agreeable sense of warmth in the chest. The cough and expectoration diminish, the temperature often becomes normal, and the patients gain in weight. At the general meeting it was decided to admit women as members of the Association, and at the annual dinner, it was announced that the Council intend to set aside some £50,000 with the view of erecting suitable buildings to form a metropolitan home for the Association.

A DENTAL DUEL.—*The Journal für Zahnheilkunde* extracts from the *Breslau Morning News* a report of the results of a dispute between two dental students ; one came from Silesia, the other from the Rhine. The Silesian thought that the Rhinelander made too much noise in the University laboratory and called him a "simpleton who deserved to have his ears boxed." The Rhinelander thereupon challenged the Silesian to fight a duel. It was originally arranged that swords should be the weapons used, but, as the Silesian said he had a sprained wrist, pistols were afterwards agreed to ; two shots at fifteen paces. This fight came off on the first of December last year, at the Swedenschanze near Oswitz. Neither of the combatants seems to have been particularly blood-thirsty. The Silesian fired first, in the air, and made it so apparent that his opponent must remark it, and the Rhinelander, who did notice it, fired some seconds later, also in the air. The seconds smoothed the way for a reconciliation and the Silesian and Rhinelander, much moved, shook hands with each other. But the end was not yet, for about July 6th they found themselves standing in Court charged with duelling, and although they urged that it had been decided that a duel in which the shots were fired in the air was a sham fight, and exempt from punishment, it was shown that the case only held good when such a method of exchanging shots had previously been agreed upon. In the present case, the second culprit only fired in the air when he saw the first had done so. There are some other amusing points in the report, but to make the story short, the Rhinelander was sentenced to three months hard labour, and the Silesian to five.

Phlegmon of the Neck.—At a recent meeting of the *Societe de Chirugie*, in Paris, several cases of deep-seated abscesses in the neck were reported. It was pointed out that where these had origin in the floor of the mouth the cause was due to pharyngitis of an infective kind, or else to a dental lesion, especially when in connection with the eruption of a wisdom tooth. These cases are always of a serious character. Several cases were quoted in which a fatal termination occurred, but amongst others described was one due to a dental origin which fortunately recovered. In this case a young man who suffered from an alveolar abscess in connection with a decayed tooth developed considerable fever at the end of three days; the neck in front and at the sides was much swollen and presented the wooden hardness present in such cases. The treatment consisted of emollient applications with small doses of calomel. Two days later the patient expectorated some very offensive pus which was followed by relief of the symptoms. More dark pus came from the mouth, but the patient was only able to leave the hospital in three weeks and was reduced to a very low and weak condition.

HOMŒOPATHIC OBJECTION TO AMALGAM.—At the recent annual meeting of the Massachusetts Dental Society a spirited discussion arose, in connection with the old-time question as to the possibility of injurious action of amalgams in the mouth. It seems that a homœopathic practitioner had been announced to read a paper on "Injurious Effects of Amalgam Fillings," but as he was not present the paper was about to be passed. A protest, however, was raised, and a resolution passed, pointing out the unfortunate wording of the title, which conveyed an affirmative statement, not in accordance with the views of the meeting. The homœopathic party endeavoured the following day to get the condemnatory resolution rescinded, but was defeated, although the practitioner was unanimously invited to read a paper on the subject of Amalgam Fillings at the next meeting.

EXPERIMENTAL PSYCHOLOGY.—At the International Congress recently held at University College, London, one of the most interesting papers was one sent by Professor Lombroso, of Turin. It was upon the subject of "The Sensibility of Women," and dealt with many of the points which we touched upon in our Editorial of April 15th. We hear that the ladies present did not appear to like the paper, although they laughed at it ; and the reader was careful to say that the responsibility for the opinions expressed, belonged to Professor Lombroso. At the conclusion of the papers, Dr. Bramwell, of Goole, gave a hypnotic demonstration upon subjects in whom suggestion in the waking state was now found quite sufficient. One of his patients had had eight teeth removed without pain.

DEATH UNDER CHLOROFORM. Under the heading of Misadventure in a Liverpool Hospital," we find an account of an inquiry as to the death of Mrs. Sarah Smith, aged 37. The patient had suffered for some time from neuralgia, due to decayed teeth, and obtained a subscriber's order for the Dental Hospital, Mount Pleasant. The house surgeon found that it would be necessary to remove the whole of the upper teeth and some of the lower, and made arrangements for the operation to be performed the following day. Dr. Gemmell, the anæsthetist, made the usual examination, and administered chloroform. After 30 drops had been used, the pulse became weak, the patient had an epileptic fit and the heart failed. Artificial respiration was kept up for half an hour, ether was injected, and the usual remedies were tried without avail. Dr. Gemmell was able to say that he had administered chloroform upwards of 1,500 times without a mishap, and Dr. Barron, who made a *post mortem* examination by the direction of the coroner, ascribed the cause of death to failure of the heart. The jury were of opinion that no blame attached to any one, and returned a verdict in accordance with the medical evidence.

Royal College of Surgeons in Ireland.—At a meeting of the President, Vice-President, and Council, held on the 4th inst., the following gentlemen were elected Dental Examiners :—

John Barton, F.R.C.S. ; Henry Gregg Sherlock, F.R.C.S., L.D.S. ; William Stoker, F.R.C.S.; Thomas Studley, L.D.S.; Charles Wall, L.D.S. ; Montgomery A. Ward, F.R.C.S. The Examinations are held in the months of November, February, and May.

Abstracts of British & Foreign Journals.

THE EXSECTION OF NERVES.

By T. W. Brophy, M.D., D.D.S., Chicago, Ill.

The neuroma, or nerve tumour, is usually connected with the nerve sheath. It may be of the nerve itself, but not frequently so. The substance of the tumour is fibrous; it is generally rounded or oval, and varies in size from the most minute enlargement to a large orange. It is usually benign in its character, and it gives inconvenience only by the pressure it exerts on the neighbouring parts.

It is sometimes free from pain; in other cases it is exceedingly sensitive to the touch. The results of their presence are dependent upon their location, and the relation they bear to the nerve tissue with which they are connected. If located at the foraminæ through which the nerves make their exit, the pain, in consequence of pressure upon the bony walls, is frequently very severe. Medicinal agents may afford temporary relief, but exsection of the affected nerve is the only reliable treatment.

Neuralgias may be dependent upon an anæmic or impoverished condition of the system. True neuroses are not amenable to surgical treatment. The terminal branches of the trigeminal nerves, the diseases of which come within the domain of oral surgery, in consequence of their situation and exposure to external violence, frequently become the seat of diseases which call for surgical treatment.

Nerve lesions occurring in subjects of gout, rheumatism, malaria, lead poisoning, syphilis, etc., call for treatment of a nature to meet the requirements of each case.

Neuromata are classified as constitutional and traumatic. Nerve tumours constitutional in their origin usually affect the whole of a particular group of nerves, and these tumours, as in muscular or other tissues, may be malignant or benign.

Traumatisms which lead to the formation of nerve tumours situated upon the supraorbital, infraorbital and inferior dental and gustatory nerves are, especially with the three former, of very frequent occurrence. The method of procedure in exposing the first division as well as the second and third should be such as to cause no visible scar. The first branch should be reached by making an incision beneath the supraorbital ridge and just beneath and close to the eyebrow. When the integument has been divided, it should be reflected upward so as to enable the operator to expose the nerve through the upper fibres of the orbicular or palpebrarum muscle. This exposure may be easily accomplished, and the nerve seized by a tenaculum or forcep and a section excised from it.

The operation for excestion of the infraorbital nerve simultaneously proposed by the late Professors Parkes, of Chicago, and Hodgen, of St. Louis, commends itself as highly meritorious.

It consists in making an incision beneath the lower eyelid, and thus entering the orbit and lifting the eye so as to reach the nerve as it dips down from the floor of the orbit to pass through the canal and makes its exit at the infraorbital foramen. When the nerve is exposed, it may be lifted and divided, after which the tissues at the incision beneath the eye may be depressed so as to expose the infraorbital foramen, and the nerve may be seized by the forcep drawn from the canal and the section thus removed.

Abnormalities of the third division are more frequently met with than they are in the first and second divisions, owing principally to greater exposure of the terminal branches as they make their exit from the mental foramen. Neuromata occuring along the course of this branch, very frequently call for surgical treatment.

No doubt diseases of the teeth are responsible for the presence of nerve tumours,especially so in relation with the inferior dental nerve. Neuromata in edentulous jaws are not infrequently due to irritation of the nerve at its exit from the mental foramen caused by a lower denture. More especially is this true in the aged. The aged edentulous jaw has no alveolar processes and no gum tissue, and becomes nearly flat upon its superior surface; it is covered only by the periosteum and mucous membrane, and the mental foramen, instead of occupying the place it formerly did, midway between the superior and inferior borders of the bone, is now on its superior surface. In such cases, the finger passed over the upper border of the jaw will distinctly feel the inferior dental nerve as it passes from the mental foramen. A lower denture adjusted in such a case will surely exert undue pressure upon the nerve, and cause great discomfort to the patient. So painful, indeed, is it in many cases, that the plate is abandoned.

The irritation of the nerve thus established, often leads to the formation of neuromata. If the denture were constructed saddle-shaped, it would not press upon the nerve, and no injury would ensue. Exsection of the inferior dental nerve should invariably be made within the mouth. Any mouth which will admit of access to the second molar tooth for the insertion of a filling will allow abundant room for the performance of the operation in question.

In performing neurectomy upon the inferior dental nerve, the operator should remove all that portion of the nerve situated in the inferior dental canal.

This may be accomplished in two ways : 1st, by separating the nerve from its branches at the mental foramen and then by the use of a tenaculum take up the nerve as it enters the inferior dental foramen (at this point it is only submucous) and draw it from its canal after which it may be excised. 2nd, The author prefers to expose the mental foramen, and by the use of a flame shaped bur, cut away the buccal wall of the canal, thus exposing the nerve nearly as far back as the ramus of the jaw ; the nerve may then be drawn forward far enough to enable the operator to excise it, and remove all that portion which lies within the canal.

To prevent its reproduction, he has, after removing it, made use of a bur and thoroughly removed the inner walls of the canal, which procedure has happily terminated in the formation of an exudate, which in turn ossifies and permanently closes the inferior dental canal, and thereby renders the reproduction of the nerve impossible.

The Dental Review.

THE DENTISTS' HYGIENE.

By E. De Trey, D.D.S., Basel, Switzerland.

In choosing an operating-room, attention must be given to the size, and especially to the height of the windows, as well as to the size of the room, which ought to be spacious. It is easy to understand that plenty of air and light conduce to better work than a restricted amount of these.

A continual subject of discussion is the point whether the dentist's residence should be at or away from the spot of his labours. The author has tried both plans. Keeping up separate apartments is expensive, but a counterbalancing benefit is the necessity of walking to and fro, and thus getting needful exercise and a change of ideas. The practitioner who simply leaves his operating-room to pass into an adjoining one for his meals, is liable to lose his appetite, get enervated and cross, and his food will not profit him as it should. If he be not forced to take out-door exercise, he will often become neglectful of it, and the less he takes, the less he will wish to take. Patients knowing that a man resides where he practises will often insist on seeing him just for a moment at undue times and in spite of orders against their admission. The combination of residence and office is useful for saving time, for easier work and study during the winter evenings. On the other hand, the dentist is thus more easily distracted by the ties of family life. All things considered, the author is of opinion that the advantages of enforced exercise ought to overrule all other consideration. Great cleanliness must reign all over the apartment. The laboratory should have a chimney to carry off all acid and vulcanizing smells and vapours, which rust and corrode metal substances lying around. For the same reason, the apartment must be well ventilated morning and evening. In short, he who takes pride and pleasure in his calling will have an inviting, comfortable, and even stylish interior, so as to please clients, and even draw compliments from them.

The operator must be very careful about his personal appearance ; he must have a special working-coat or jacket, to avoid carrying with him tobacco and other odours. A white, easy-fitting garment is desirable. In winter a warm Jæger coat is practical, though the best thing is white cloth or smooth silk, which both look and feel clean and neat. Black coats easily become greasy by contact with the patient's hair, or soiled by the cosmetics which ladies sometimes use.

It is difficult to lay too much stress on these niceties, which are much appreciated by the better class of clients, and the observance of which tends to build a good practice. Footwear must be soft and warm in winter, light and fresh in summer ; special pairs being kept for exclusive use in the dental office. A low shoe of good calf, flannel or fur-lined, is best in cold weather. Prolonged standing is fatiguing, therefore the dentist should have his feet easy and comfortable. A warm foot-bath after the day's work is over is often beneficial, for it promotes the circulation and relaxes the nerves. Intellectual effort draws the blood to the head, and the feet get cold in consequence, a thing to be avoided, as warm feet and a cool head insure good digestion.

The old saying of warm feet, cool head, and loose waist is to be remembered and practised. The pressure of a hard collar on the veins of the neck during the various flexions of the head brings on congestion of the brain ; and this is very bad in the case of thick-necked men with apopletic tendencies. A fine white flannel, with loose silk tie, would be best, if etiquette allowed it.

A dentist must have perfectly clean and well-kept hands, with nails not too long. The hands should be washed in the patient's presence, and every time the dentist is called out of his room.

Above all, the dentist's own mouth must be in a fit and proper condition ; a bad breath is sufficient to drive away patients.

The posture of the body whilst operating, has considerable influence on the health. It is rare to find a dentist who knows how to place his patient in the chair so as to facilitate his own work and avoid mutual torture. While possessing all necessary means for working with comfort to themselves, why will not dentists take the trouble to put their patients in a position easy for both parties, instead of going through a sort of gymnastics hurtful to the eyes, lungs, and stomach ? The right eye of a dentist who does much gold-filling, after fixing the same brilliant spot for hours, gets tired, and becomes weak long before the left one. Deviation of the visual rays is an affection which almost always affects the right eye, and is caused by the ocular globe being twisted away from its normal position, when some muscles are overstrained and others relaxed ; this habit in time dims and weakens the vision. The best and simplest way to avoid this trouble, is to so place the patient in the chair as to bring all available light on the point of operation, and to look at it in a straight line, and not from a slanting direction. Also, one must learn to operate on both sides of the patient, and from behind as well as in front. By means of these different positions, the visual rays enter squarely into the eye in its normal and unstrained position, and not sideways, and both eyes work equally. These methods of operating are soon learned, and their advantage quickly perceived. Operators will do well to think of the means of preserving their eyesight while still young, before becoming slaves to spectacles. Their usage is a source of annoyance to the practitioner, because the patient's breath clouds them, causing loss of time in removing and wiping. A good magnifying-glass should always be at hand, to avoid straining the sight looking at small objects, such as burr-heads for instance. Blue glasses are good for softening glare and change of light. The means of bettering the sight when it begins to fail are numerous, but the simplest and best are rest and refreshing sleep, such as hygiene and exercise produce ; reading at night, indulgence in alcohol and tobacco must be given up. Electric, petroleum, and all lamps with too powerful a glare are to be avoided ; the old moderator lamps are the best. Few organs of the body are so sensitive to the diseases of the stomach, as the eyes. Dimmed and vacillating vision, pain behind the eyeballs, watering eyes are almost always symptoms of a disordered stomach. As a rule, let us not turn night into day, but, returning to the ways of our forefathers, go to bed and rise early. They know not the use of spectacles before old age, nor did they need the various exciting modern condiments.

In the course of numerous excursions in the Alps, the author has made some curious observations on the changes going on in the country at large. With the advent of coffee, sugar, spices, and alcohol in the most secluded valleys, the hitherto vigorous and healthy inhabitants have begun to lose their fine teeth and flowing hair. All sorts of infirmities, unknown before, have appeared among these hardy mountaineers. The author is quite convinced that this is due to alterations of the blood, brought about by exciting foods. Let us leave hot things to hot lands, and cling to what nature grows in our temperate zones. The first effect of these stimulants seems to be renewed life, vigour, and keenness, but their continued use brings in time prostration and even loss of health. Such is also the case with plants transferred from their own natural soil into a richer one : they thrive, increase in size and beauty, then droop and die away. Nervous diseases and folly count more victims nowadays than formerly in town or country, thanks to bodily and mental excitement and fast living. Let us work quietly day by day, not peering too far ahead into the future. Thus, money will be more slowly acquired, but the faculty of enjoying it in old age will be preserved. On hygiene depends the surety and suppleness of the hand, the clear vision of the eye, and on these does the dentist himself rely. Delicacy of touch is a gift, which can be developed, but not acquired; few possess it, and those who do should not imperil it by excess of any kind. It can be cultivated from infancy and maintained through life by manual exercises. This attribute can be unconsciously lost by excesses. The abuse of wines, spirits, and tobacco leads to that of narcotics, which doctors and dentists have within their reach. No words can tell the sufferings to be encountered before the habit is broken. Unfortunately, numbers of medical and dental men use these drugs themselves, though they forbid them to their patients. Here are the words of a specialist in nervous and mental diseases, Dr. Foree, of Zurich: "How great a number of men are lost to science by the use of alcohol! Even what is called a moderate amount is sufficient in time to alter the tissues and weaken the mental faculties." Total abstinence is more profitable than simple temperance. If the thoughts and actions are not so quick, they are all the more reliable; fatigue and ailments have less hold on the total abstainer.

The strength and suppleness of the hand depend on that of the body. All exercises of sport and gymnastics, abundant in youth, more moderate in manhood, are a boon to the body.

International Journal.

PRODUCTION OF PLATINUM IN RUSSIA.

The platinum beds of the Ural mountains, according to the *Journal de la Chambre de Commerce de Constantinople*, are the only ones in the world in which this metal is found in grains. Platinum is found in Brazil and in the Cordilleras in the hard serpentine rocks, but never in the form of grains. The platinum beds of the Ural mountains are found in various districts. In the north, at Besserski, in the government of Perm, in the district of Khotourski, and in the State properties of Goroblagodatski, where sixty-six mining concessions have been granted. All the beds of the northern region are situated in the basin of the River Touri, in that of the tributary stream of Taghil, and in other tributaries higher up. On the western declivity of the Ural mountains there is another platinum bed near the River Outka, a tributary of the Tchoussova, and the basins of the higher tributaries of the Outka, near the Ural river. The platinum found in these places is in the form of grains, in sand frequently containing gold. The weight of these grains is from 17 to 21 grammes to every 1,640 kilogrammes of sand. The richness of the platinum beds varies in the same proportions. In some, the thickness of the turf covering the sand does not exceed from 2.16 metres to 2·88 metres, while in others it varies from 10·80 metres to 14 metres, so that it becomes necessary to work underground. The thickness of the platinum sands does not vary much. A noticeable characteristic is that they are found in the form of friable grit, and easily washable. The clayey sand is rarely met with. The beds in the northern districts of the Ural mountains are most frequently of little depth, thus allowing the turf to be easily removed and the platinum is quickly reached. The platinum found in this district contains a considerable proportion of gold, whereas that found in the Taghil district contains hardly any.

Moreover, the Northern platinum and that of the Taghil district are very different in appearance. The former appears clear and very brilliant, while the latter is of a dull colour and is frequently found mixed with rare metals such as iridium and osmium. The size of the grains is about the same in the two beds. The demand for platinum for industrial purposes is relatively restricted, as it only dates from the last twelve or fifteen years. It is largely used for electric lighting and dynamo conductors, and considerable quantities of platinum are now employed in chemical and other factories. During the last twelve years the annual production of platinum has averaged about 3,194 kilogrammes, of which half has been derived from the beds in the north of the Ural mountains belonging either to the State or to private persons. Throughout the whole world only about 3,270 kilogrammes of platinum are annually used, but it is anticipated that this amount will soon be considerably increased, and it is stated that the platinum beds of Bisserski can alone supply the total quantity required for the consumption of the world. When the demand for platinum was insignificant and the price very low, the gold miners who found platinum while seeking gold, frequently, it is stated, used the former instead of lead, as shot for firing at wild birds. It is only since the demand has increased that greater attention has been paid to this metal. All the platinum extracted from the Ural mountains, after having paid a tax of 3 per cent. in kind, is sent as raw ore to St. Petersburg for treatment and shipment to foreign markets.

Jour. Soc. of Arts.

THE INFLUENCE OF TOBACCO ON GASTRIC DIGESTION.

Dr. J. Ydan-Pouchkine reports a number of experiments, which he has made in this connection, on seven healthy individuals, who were not habituated to tobacco-smoking.

He first examined the effects of tobacco on the gastric juice and the motility of the stomach, and on the degree of absorption. For three days the author examined the gastric juice and motility of the stomach, noting the degree of motion of the stomach by salol, according to the process of Ewald, and the rapidity of absorption with the iodide of potassium, according to the method of Zweifel, during a second period of three days each, in which the individual smoked, respectively, twenty-five cigars daily. For three days after this period, the author continued the examination of the gastric juice to determine the after-effects of the tobacco. His conclusions are embraced in the following statements :—

1. Tobacco increases the quantity of gastric juice, but diminishes its acidity.

2. The quantity of free hydrochloric acid of the gastric juice is diminished under the influence of tobacco.

3. Proportionately to the decrease of the amount of hydrochloric acid there is an equal diminution of the digestive power of the gastric juice.

4. Tobacco, likewise, slows the action of the gastric ferments.

5. These modifications in the gastric juice, produced by tobacco, last for a period of several days.

6. As regards the motility of the stomach, and its power of absorption, tobacco produces an increase of these functions.

Items of Interest.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, held June 13th, 1892, Mr. J. H. Mummery, M.R.C.S., L.D.S., *President*, in the Chair.

The minutes of the previous meeting having been read and confirmed,

The PRESIDENT said that it was his painful duty to have to announce two losses by death since the previous meeting. Mr. Felix Weiss, who had long been a Member of the Society, and had rendered valuable service as Librarian, and also as President, had, as they were aware, passed away a fortnight previously. Mr. Alexander Fothergill, of Darlington, an old practitioner and Member of the Society, had also lately died. He was sure that the Members of the Society would join in the vote of condolence which had lately been passed by the Council.

Mr. HENRY WILLIAMS MESSENGER, L.D.S.I., of Clairville, 47, Rosslyn Hill, Hampstead, was nominated before the Society for Resident Membership.

Mr. WILLIAM RUSHTON was balloted for, and duly elected.

THE LIBRARIAN (Mr. ASHLEY GIBBINGS) had only to announce the receipt of the *Smithsonian Report* for 1889.

The CURATOR (Mr. STORER BENNETT) had received one specimen, a lower vulcanate plate with two clasps for carrying two central incisors. The clasps passed round the two lateral incisors. The plate had been in the patient's mouth fifteen years, and was entirely encrusted in tartar, which had no doubt been deposited and caused absorption of the bone. The plate was embedded in soft tissue, and nothing else. The Society was indebted to Mr. Redman, of Brighton, for this specimen. Mr. Storer Bennett had also just received a specimen which he had not had time to examine ; it was a rough cast of two teeth, evidently a case of false gemmation. It was sent by Mr. Wells, of Tasmania.

Mr. A. PEARCE GOULD, M.S., F.R.C.S., communicated on behalf of himself and of Mr. JOHN MURRAY, M.D., F.R.C.S., casualty surgical officer to the Middlesex Hospital, the notes of a case of fracture of the neck of the lower jaw.

He said cases of fracture of the neck of the lower jaw were so rare, that they need offer no apology for putting on record before that Society one that had been recently seen in the casualty department at Middlesex Hospital.

Mrs. F. S., aged 30, was driving in a dog-cart on the evening of April 10th; the horse took fright and ran away, and the dog-cart came into collision with a cab. Mrs. S. was thrown violently out on to the road, falling on her chin. She immediately felt pain just in front of the right ear, and noticed that she could not completely close her mouth, and that blood was flowing from the chin and lower lip.

The patient came to the hospital next day, April 11th, and she was found to have a deep cut across the chin, exactly over the lower border of the jaw-bone, and another wound completely severing the lower lip.

There was a swelling on the right side of the face just in front of the ear and below the zygomatic arch, which was painful and excessively tender. Any attempt to open or close the mouth caused acute pain, which was referred to a spot just in front of the lobule of the ear, and the patient complained of feeling a "click" when she moved the jaw. The line of the teeth in the two jaws did not correspond, the lower teeth being displaced backwards and to the right, so that the interval between the lower central incisors was below the right lateral incisor tooth. By pressing forwards the right angle of the lower jaw, this displacement was corrected, and at the same time crepitus over the neck was plainly felt.

Fortunately, it was not difficult to retain the jaw in its proper position, and the old-fashioned jaw splint and four-tailed bandage were found quite efficient. After three weeks the splint and bandage were discontinued: the patient could then open her mouth so as to separate the incisors about half an inch, and she was free from pain. There was then considerable thickening of the jaw, extending from below the zygoma some way down the right ramus.

On May 30th, this thickening was much less, and the movement had improved. The patient was present, and the Members of the Society would be able to feel some slight thickening over the neck of the jaw still left, and to notice that there was now but little limitation of the movement of the temporo-maxillary joint.

There seemed no reason to question the diagnosis in this case. Violence to the chin was known to be one of the two ways in which fracture of the neck and condyle of the jaw was caused. The pain, tenderness, crepitus and swelling, all exactly localised the fracture, and the displacement was characteristic. The mode in which this displacement could be corrected and the thickening from callus-formation also confirmed the diagnosis.

This fracture was stated to be a rare one. In the last edition of Hamilton's classical work on "Fractures and Dislocations" (1891) it was stated that only nine similar cases were on record. In some of the cases the injury had been a fall or heavy blow upon the chin, causing a simple fracture of the neck of the bone. In other cases the violence had been applied to the side of the face, and the neck of the condyle had been broken on the side struck, and the body of the jaw had been fractured on the opposite side. In one case there was fracture on the neck on each side, of both coronoid processes, and at the symphysis. In a case recorded by Watson, although there was obvious deformity from retraction of the chin, inability to open the mouth and painful crepitus, no treatment was adopted.

The line of fracture had varied in the few cases that had been dissected, but generally it passed across the bone obliquely, and below the external pterygoid muscle. Sir Wm. Ferguson figured an example of a transverse fracture of the neck.

The injury was probably more frequent than Hamilton supposed, particularly when produced by severe violence to the side of the case when it was associated with other fractures of the same and other bones.

The amount of displacement varied considerably; in one case, recorded in 1785, the ramus had passed so far up and over the condyle that this fragment was united by a large mass of callus close above the inferior dental foramen. And Mr. Holmes recorded a case in which the upper end of the ramus was displaced into the external auditory meatus, separating cartilage from bone, and where the abundant discharge of serous fluid from the ear simulated the escape of cerebro-spinal fluid in a case of fracture of the base of the skull.

In some cases the condyle had been found to be very moveable in a forward direction; this symptom they did not detect.

The PRESIDENT remarked that it was a very interesting case, but he supposed that it had not fallen to the lot of any one present to see such a case ; he should, however, be glad to hear remarks.

Mr. PATERSON had seen a case of fracture involving the ramus of the lower jaw high up, but just short of the neck of the condyle, coupled with a fracture extending through the body of the bone on the opposite side, at a spot immediately behind the canine tooth. The patient, a boy, had been dragged through and severely crushed by machine rollers ; other parts, *e.g.*, thorax, &c., were injured. The fractured jaw was kept in a satisfactory and comfortable position by means of a padded, perforated metal chin splint, applied externally, and a wool pad over the region of the condyle. He (Mr. Paterson), however, had intended a modification of Gunning's splint, with a high outside wing on the side of the fractured ramus, but the patient, after being in hospital seven days, died.

Mr. J. SMITH TURNER said that there was only one remark that he should like to make, and that was that it was very satisfactory to know that the old four-tailed bandage had not been forgotten ; he believed it was a very useful surgical instrument. He might mention another satisfactory point to statisticians and those who were fond of getting figures together, viz., that this was stated to be the tenth case, so that in future they might work their figures in decimals.

Mr. BETTS saw a case about a month or six weeks previously. A lady fell from her horse, and was kicked by it under the chin, fracturing the bone between the left incisor and canine. The fracture was done up in a four-tailed bandage. Many of the molars were broken obliquely, as if struck with a chisel and hammer. The patient at the time had very great pain in the region of the condyle, but what led him to mention the case was that neither the molars nor bicuspids met, although the molars were in good position ; only the wisdom teeth met.

Mr. PEARCE GOULD then spoke upon the subject of "Excision of Dental Cysts *versus* Incision and Drainage," as reported on page 735.

Mr. PATERSON desired to know whether the bicuspid teeth mentioned by Mr. Gould as absent, had ever been erupted, or if not, whether they were subsequently found by the operation to be in the cyst, or in connection with it? He (Mr. Paterson) had recently treated cysts, and not involving the antrum, by packing with strips of lint, or washed tape soaked in a very strong solution of chromic acid. The drug set up violent inflammation of the cyst wall, followed by free suppuration, and in two cases the lining of the cyst sloughed and was drawn out by tweezers. The cure was, he found, speedier by this method. He remarked that the drug was a powerful one, and care and attention were necessary in using it. He pointed out that strips of lint for packing purposes had a tendency to fray out and tear into fragments, especially if retained for any length of time, and instanced two cases of long continuance of discharging dental cysts by reason of this, and the negligence of the patients entrusted with the daily dressing of their own cases. From one he removed seven strips and portions of strips, all very foul, and from the other, five similar dressings, or parts of dressings.

Mr. CORNELIUS ROBBINS said that within the last four months he had had a case which well bore out what the writer of the last communication had stated. A patient, aged about 60, came with a large fibrous cyst in the lower canine region; he made an incision and packed it with carbolized lint. He saw the patient the next day, but not liking the appearance of the case sent her to Mr. Christopher Heath, who removed the cyst, and the opening healed very rapidly. Mr. Robbins has since made a set of teeth for the patient.

Mr. E. LLOYD WILLIAMS thought that unless Mr. Pearce Gould assured them that the cyst contained one or more teeth, it was properly an ordinary dental cyst, and not a dentigerous cyst.

Mr. WILLIAM HERN had treated several of these periosteal cysts illustrating the uselessness of tapping. In most of the cases which had come under his care he had enlarged the cyst, stuffed it with lint, and allowed it to granulate up.

Mr. PEARCE GOULD, in reply, said that he did not intend to convey that the bicuspids had not been erupted; he thought they had been removed. Mr. Lloyd Williams was quite correct in describing the cyst as a dental cyst, but he (Mr. Gould) could not quite agree with him as to the simplicity of treatment.

Mr. S. J. HUTCHINSON said that he did not propose to take up the time of the Society, but at a previous meeting, when the discussion on the anterior protrusion of the upper teeth took place, Mr. Woodhouse alluded to unilateral protrusion in adult patients. He (Mr. Hutchinson) had an exceptionally good model of such a case, and he thought it would be of some interest. It was an exceedingly typical case. The patient was 36 years of age, and she had not noticed the protrusion of this tooth until the last six or twelve months. He would not attempt to explain it on this occasion, but would ask the Curator to place it in the Museum as a very good case.

Mr. J. SMITH TURNER said that he had been put down on the agenda paper to call attention to the teeth of the Guanches. The Guanches, as they would probably be aware, were the ancient inhabitants of the Canary Islands, off the coast of Africa. They were pretty well exterminated by their conquerors, the Spaniards, in 1474, so that the lower maxillæ which he had to show them might be reckoned to date before that period. The teeth of these Guanches were not likely to get mixed up with the teeth of the conquerors, as they were in the habit of stowing away their dead in caves. He was indebted to Dr. Chill, of Las Palmas, for the specimens. It appeared that the "teeth harriers" had been there long before the scientist, as the incisors and bicuspids were all gone. It was the custom of dentists in early days to cut up human teeth to supply the wants of their patients—artificial teeth being unknown or too inferior to be generally used—and the battle-fields of Europe were ransacked for this purpose. His object was to call attention to these teeth. They would notice that the masticating surfaces were all ground very smooth: all the teeth of those who had lived to any age had that characteristic. They were worn away just as the ancient Britons' were worn, because they ground their corn in stone mortars, and these mortars were very friable, being composed mainly of pumice stone. Another point with reference to the teeth was, that there were sundry marks of decay and traces of alveolar abscesses and caries, showing that these people had evidently enjoyed the luxury of toothache without having the advantage of dental care. He had also the skull of a mummy, the teeth of which were very perfect; the lower wisdom teeth had a transverse position, and were growing into the twelve-year-old molars. Mr. Turner observed a large cavity in each twelve-year-old molar, immediately opposite the crown of the wisdom tooth. He thought it a very good example of a well-worn and well-developed lower maxilla. Mr. Turner, while in the Canary Islands, picked up about 260 teeth which had dropped out of the skulls, of which a large number were more or less decayed. He had also a specimen of a gemmated central and lateral incisor. He only saw a very few skulls of children, and in none of them did he find any decayed teeth.

The PRESIDENT asked if Mr. Turner could say upon what these people had fed?

Mr. SMITH TURNER replied that they were chiefly vegetarians.

Mr. DAVID HEPBURN described an instrument for guaging the length of the canal in antral cases. Mr. David Hepburn said that after creating an opening into the antral cavity through the socket of a tooth, it was frequently necessary to insert a drainage tube attached to a plate, and in order that the tube might act, it was essential that it should be of the proper length. He had experienced great difficulty in ascertaining, with ordinary probes or excavators, the relative position of the floor of the antrum with regard to the external opening of the canal, and had, therefore, devised an instrument with which the position of the parts could be ascertained with rapidity, certainty and absence of pain or inconvenience to the patient. When fairly in the cavity a handle is pressed, when two horns emerge; these act as grappling hooks, but can in no way injure the tissues, being made of watch-spring. By means of the hooks, the floor of the antrum can be distinctly felt. A movable gauge is then adjusted to show the position of the external opening, and the horns being drawn in by pulling the handle, the instrument may be removed.

Mr. F. CANTON exhibited the model of a boy's mouth, showing the left central abnormally large. It was not in his opinion a case of gemmation, as the lateral was distinctly visible behind it.

Dr. RÖDER (of Budapest) presented an elevator of his invention specially intended for extracting teeth of wisdom with the crowns broken off—an operation either altogether impossible by means of the instruments hitherto in existence, or accompanied by excruciating pain. He used the same instrument with advantage in a variety of other difficult cases, as well as for extracting even the smallest fractions of stumps.

Mr. ACKERY said with regard to Mr. Canton's model, that it certainly seemed to him that it might be a case of gemmation with a supernumerary or supplemental tooth.

Mr. F. CANTON did not think that it had that appearance at all.

Dr. HEWITT then read his paper on "The Anæsthetic effects of Nitrous Oxide administered with Oxygen at ordinary Atmospheric Pressures: with remarks on 750 Cases," which appears on page 721.

DISCUSSION.

Mr. G. H. **BAILEY** very warmly eulogised the enthusiasm, ability and energy which Dr. Hewitt's paper displayed. He had not had the experience of Dr. Hewitt with nitrous oxide and oxygen combined, but he thought from Dr. Hewitt's figures, the average of "going off" was over two minutes, the average anæsthesia seemed to be thirty-four to forty seconds, but curiously enough the number of teeth got out, did not appear to be so many as with ordinary nitrous oxide —2.7 did not seem to him to be a large number; he could not help thinking that with ordinary gas it would be more. The patient certainly had no loss of colour, no jactitation, no "phonation"—although he saw no objection in this—there was no rigidity; these were advantages. At the hospital they had an excellent nurse, and he had asked her, "What difference do you find between the days we have pure nitrous oxide and the days we have the mixture—have you less noise but more sickness?" And she said, "Certainly." This was in favour of the mixture. But he had observed in conversation with Dr. Hewitt, that the complication of the apparatus and the uncertainty of the amount to be given were objections. Now as to change of colour under the gas, he did not think that there was very much change of colour with nitrous oxide; his custom was to use the expiratory valve only, and to keep a general pressure with the hand upon the bag, and practically one obtained good anæsthesia, lasting at least twenty seconds. Now he would just take the list of cases he had had that day:—

(1) Pure nitrous oxide and a little ether administered. The eye of the patient was taken out in two minutes. Now with Dr. Hewitt's apparatus, the patient would be "going under" during this two minutes.

(2) A boy, aged 10; a lower molar removed, no change of colour, no jactitation, nitrous oxide being given alone.

(3) Nitrous oxide and a little ether: ten teeth removed in one minute and a half.

(4) A gentleman of large build, very muscular; tooth removed without noise in one minute and a half. Nitrous oxide.

(5) A boy, who had just come in from cricket, said that

ether disagreed with him; had pure gas, tooth out in fifteen seconds.

(6) Five teeth removed from a very ruddy full-blooded man; no unpleasantness. Nitrous oxide only.

(7) A young fellow of the bull-dog sort, very bad teeth, had gas only; the tooth broke, but afterwards came out; no change of colour, no jactitation, barring a little kicking.

That was his experience of the day. If he had given the mixture in these cases he thought that they would have said he had had a good result. It struck him that anæsthesia with nitrous oxide only was not so short as Dr. Hewitt stated; it would, unquestionably, last for the removal of three teeth. With regard to children varying from 10 to 13, he believed he had in one morning ten of them; there was no phonation, no kicking, and the breathing was beautiful. Dr. Hewitt thought the recovery was not so good with the mixture as with nitrous oxide. If that were the case, surely, with the complication and other disadvantages, it was not so valuable. As to the length of time "going off," Dr. Hewitt very kindly gave him (Mr. Bailey) gas on two occasions, and the last time he said "Shall I give you a mixture with oxygen?" But he (Mr. Bailey) said, no, he would rather not, as he took gas so very well. However, he was a long time getting under the influence of the gas. He thought the length of time getting into a state of anæsthesia was a very serious objection, as it was very trying to the friends of the patient. When giving nitrous oxide it was his custom to count the alphabet, and he never got a struggle further than between G and H. If one could get a patient under the influence in nine seconds, that seemed to be a good result, and it was the valuable thing in nitrous oxide, viz., the shortness of time in which one got anæsthesia. He could not help thinking that Dr. Hewitt troubled himself unnecessarily about the change of colour. When nitrous oxide first began to be given the leading physicians, Gull, Jenner, and others objected to it, owing to the change of colour which it produced, but what happened? After they had seen it given for a little time, they all said that there was no harm whatever in this symptom, and that, Mr. Bailey thought, was as present the general consensus of opinion. The jactitation might be, certainly, a bad thing, but that would vary enormously and very seldom prove troublesome. He had given gas to his own little child before she was 3 years old, and he had even given it to children only one year old. Again, he had given pure nitrous oxide to a lady of 96, and there had been no change of colour. Dr. Hewitt said that 76 of the cases were perfect, but if one took 153 cases of pure nitrous oxide he (Mr. Bailey) thought one would get as good a result. He had never given ether with the students at the Dental Hospital, because he thought that they should learn to give nitrous oxide pure, and he believed he got quite as good a percentage as Dr. Hewitt with the mixture. With regard to the apparatus, it seemed to him to be all but perfect, except for its somewhat ungainly bulk, but the question was if it was desirable to have so complicated an apparatus. In conclusion, he begged to thank Dr. Hewitt most heartily for the manner in which he had carried out his investigations.

Mr. Rowell said that it had been his privilege to assist Dr. Hewitt, and he had also given the mixture on his own account. He could only say that he thoroughly concurred in all Dr. Hewitt's conclusions. He commented upon the very high excellence of the paper from a scientific point of view and the great difficulties Dr. Hewitt had had to encounter. Referring to the blood pressure under the mixture, Mr. Rowell said a physiologist put a dog under the mixture, and found no more increase of blood pressure than if it had been given air alone. Without going into details, he would just mention one case which was quite enough to show that it was not deleterious. A German physiologist put a dog under it for forty-eight hours, and it woke up all right, except that it was rather "off its feed." There was one point that he wished to emphasise, and that was the beautiful sleep-like condition which was most marked with the mixture.

Mr. Lloyd did not agree with the previous speaker as to the advantages of the "sleep-like condition;" he thought it rather a disadvantage, as it rendered difficult the detection of when the patient was fully under the influence of anæsthesia.

Mr. R. H. Woodhouse wished to say only just one word in justice to Dr. Hewitt, and that was to put on record the fact that his (Dr. Hewitt's) operations were mostly done by students, and though they did their work with great care and did it very well, still they had not had the experience of dentists in practice. Again, if the students broke a tooth it was *their* fault, whereas if a qualified man did so it was *the tooth's* fault, so that this would tend to make them longer in their operation. He had had the opportunity of observing

Dr. Hewitt's cases, and the conditions had been splendid; it was only the after effects that he had any doubts about, he was not sure that there was not more headache with the mixture.

Dr. DUDLEY BUXTON said that he could not but feel that with the hand of the clock pointing to five minutes to eleven, it would be impossible to attempt to enter upon anything like a detailed criticism upon Dr. Hewitt's paper; he would therefore content himself with offering him his congratulations upon the valuable contribution they had heard read.

Mr. WILLIAM HERN, as one of Dr. Hewitt's colleagues, desired to bear testimony to the very great care with which Dr. Hewitt had conducted his investigations, and to express his sense of the high scientific value of them; he also wished to add that he had been very much struck with the splendid effects upon children which the mixture produced, from the point of view of the operator.

Mr. W. T. TROLLOPE did not propose to occupy the time of the Society for more than a few minutes, but as he had been using the mixture of nitrous oxide and oxygen for the last eigtheen months, he should like to say that his experience had been entirely in accordance with Dr. Hewitt's. He had been using the apparatus that was first shown by Dr. Hewitt at Brighton, from a telescopic gasometer. He certainly found the results most satisfactory; he got longer anæsthesia and no stertor, &c.

Dr. HEWITT, in reply, said that it only remained for him to thank them very cordially for the discussion. With regard to Mr. Bailey's remarks, Mr. Woodhouse had answered in one way what Mr. Bailey was wishing to know, but Dr. Hewitt thought that 2.7 was a very good average for students. Perhaps in private practice it was possible to get more teeth out, but it must be borne in mind that these statistics were compiled mainly from hospital work. Mr. Bailey said that there was very little change of colour; Dr. Hewitt would not contradict this. It was possible that one did not always recognize the change of colour; he usually got others to notice the lividity under nitrous oxide, and want of change of colour in oxygen cases. He should say no more on the subject, but he maintained that there was no change—or very much less with the mixture than with nitrous oxide alone. Dr. Hewitt did not claim that the combination was best for all cases, but he looked upon it as a good alternative to nitrous oxide, and better than it for many cases. Mr. Rowell had said that the dog was under the influence forty-eight hours. as a matter of fact he was kept under for seventy-two hours, and at the end of that time the only difference in him was that he was not quite so lively as before. Mr. Lloyd objected to the sleep-like condition, but the signs he (Dr. Hewitt) had referred to were reliable and tangible signs. The last speaker had very kindly referred to his administrations of nitrous oxide and oxygen. There were several dentists in the provincial towns who were using the mixture, and he (Dr. Hewitt) had received many letters from them. He had said very little about the actual safety of the mixture, but if it could be said that anything was safer than nitrous oxide and oxygen.

Votes of thanks and announcements for next meeting concluded the business.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual monthly meeting of this Society was held on Friday evening, June 10th, at 8 o'clock. W. Robinson Humby, Esq., President, in the chair.

The minutes of the previous meeting having been read by Mr. Reginald Bascombe (in the unavoidable absence of the Hon. Sec., Mr. Cecil Bascombe,) and confirmed, the President gave the usual form of welcome to the visitors present, at the same time expressing his pleasure at again seeing amongst them students from the Dental and Guy's Hospitals.

Messrs. Simmons and Tice were proposed as members, and nominated for election.

There being no Casual Communications, the President called upon Dr. Maughan to read his paper upon "The Employment of the Perceptive Faculty, or, Mistakes in Dental Practice."

The President said he had felt considerable interest in the subject of "Mistakes in Dental Practice," but was relieved to find that the mistakes treated on by Dr. Maughan, were chiefly Medical and Surgical, and that the Dental errors were few in comparison. He was afraid from *their* experience of dental errors, if *they* were to discuss them at all, they would be numerically very few. He should say that as to Dental and Surgical mistakes, the proportion would be about six of the one to half-a-dozen of the other. He had a distinct recollection of one in his own practice, where what had seemed to be a dental abscess formerly connected apparently with a wisdom of the upper jaw, was brought before his notice. The tooth was loose and elongated, pus has escaped round the neck, the gums were examined for foreign substance and the decision of two dentists was " Death of the wisdom pulp," but the tooth still maintained a good colour, and his own opinion had been that the tooth was alive. The patient, against his advice, decided to have the tooth drilled into, the result showed that the pulp was still living, so that he was as far from the truth as before. The 2nd molar was filled on the distal aspect with a large amalgam, this he removed, and as the tooth was capable of feeling hot or cold substances, the cause could not be referred to it ; but the only satisfactory explanation was that calcification advancing from the distal aspect of the tooth, had isolated the post buccal pulp, causing its death, and thus setting up the trouble. He cited this case to show how difficult it was to steer clear of mistakes.

Mr. WOOLF complimented Dr. Maughan on the excellence and instructiveness of the paper. He said he was glad to see that Dr. Maughan had laid so much stress upon the carrying out of the fundamental principles of our everyday practice. He thought they could not receive ' too much attention.' In referring to the subject of anæsthetics, he said he should very much like to see more chairside demonstrations given. He felt sure students would distinctly benefit by an *occasional* demonstration on the treatment of patients in cases of emergency. It was a great mistake to think that the mere reading of the subject would suffice. What men wanted was practical acquaintance with the subject. He made comparison between the man who gained his knowledge from books, and he, who with a much more limited knowledge, was yet able to put it to the practical test when occasion required. He thought one should hold oneself in readiness for emergencies. Dr. Maughan had narrated an anecdote about a medical student, who, when giving gas to a patient at a general hospital, was deluded by the patient's glass eye. He would also mention another case, which had had the effect of teaching him an important lesson. An old gentlemen was having a gold crown fitted to one of the upper central incisor stumps when the operator had the misfortune to let the crown slip into the patient's mouth. Instead of immediately pushing the patient's head well forward, he inserted his two fingers and endeavoured by that means to regain possession of it. It was not until the patient began to cough violently that he bethought himself of the proper treatment. Unfortunately it was too late, for the crown had disappeared into the back of the jaws. He mentioned that the patient returned within forty-eight hours, bringing with him the crown, (wrapped up in a piece of tissue paper), which he said he had coughed up shortly after leaving, on the previous day. He maintained that all such cases assisted in proving the value of practical knowledge in relation to our work.

Mr. CLARENCE READ remarked that Dr. Maughan had just mentioned a case of Malingering. Some two years ago he had seen a very interesting case of the same thing. A girl aged about 17, was brought up to the Dental Department of Guy's Hospital by her elder sister, complaining of a swollen face, and inability to open her mouth. The House Surgeon tried to examine the mouth, but the patient said she could not open her teeth in the least, and would not and so he called the Assistant Dental Surgeon for the day. He managed to separate the lips just a little and his suspicions were aroused, so the Dental Surgeon was asked to see the case, and she was accused of having something stuffed in her cheek, as they had managed to see just a small piece of the material. The patient was sent into a room with her sister and a nurse ; after about half-an-hour's persuasion, she spat the mass into her handkerchief, and refused to let either of them see it, she was given a mouth wash and told to come up the next day, but she never came near the hospital again. She must have added some of the material every few days, as the swelling had been slowly increasing for a few weeks. With regard to the necessity of having a third person in the room when an anæsthetic was given, he would quote a case which he had seen of a factory girl, to whom gas had been given for the extraction of several teeth ; while under the influence of the anæsthetic she made several obscene remarks, and when she came to, she said that she had been telling us all her secrets. Now this is a case in which the girl might have thought that a criminal assault had been committed, if there had not been several people in the room. Nervous, excitable young women, are very liable to these delusions. Dr. Maughan had mentioned a case of a tooth-brush bristle getting between two teeth and just below the gum, causing a lot of pain; a ligature left behind, after removing the rubber dam, will do exactly the same.

The usual vote of thanks terminated the business of the meeting.

Dental News.

ROYAL COLLEGE OF SURGEONS, EDINBURGH.

The following gentlemen having passed the requisite Examinations were admitted Licentiates in Dental Surgery :—Thomas Nash, Edinburgh ; Henry Alexander Matheson, Edinburgh ; John Malcolm, Edinburgh, and James Joshua Martin, Bradford.

APPOINTMENTS.

Dolamore, W. H., M.R.C.P., L.R.C.S., L.D.S., appointed Assistant Dental Surgeon to the Dental Hospital of London.

Donagan, A. E., L.D.S., R.C.S., Edin., has been appointed Dental Surgeon to the Royal Institution for Deaf and Dumb Children, Birmingham.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Strert, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications : name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only, and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under :

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ON THE ANÆSTHETIC EFFECTS OF NITROUS OXIDE, WHEN ADMINISTERED WITH OXYGEN AT ORDINARY ATMOSPHERIC PRESSURES: WITH REMARKS ON 800 CASES.

By FEEDERIC HEWITT, M.A., M.D. Cantab.

Instructor in, and Lecturer on, Anæsthetics at the London Hospital; Joint Administrator of Anæsthetics at Charing Cross Hospital; Anæsthetist at the Dental Hospital of London, and at the National Orthopædic Hospital.

(*Concluded from page* 734.)

Series 13 (162 *Cases*).

The apparatus* used in this, the last series, differs only from that just described in that its oxygen holes are about one-half the size. This slight alteration has proved a very important one.

Two india-rubber bags are employed; one for nitrous oxide, the other for oxygen. These, which are fed from cylinders worked by the foot, are attached to two metal tubes. Where the tubes join, there is an arrangement by which oxygen may be added to the current of nitrous oxide to the desired extent. Above this regulating arrangement with its dial, indicating handle, and indicator, there is a two-way stop-cock, which allows, by the movement of its handle, either of air or of the mixed gases being breathed. In order to permit the free escape of each expiration, two flap-valves, one an expiratory, and one an inspiratory, are provided. The tubes also possess flap-valves to prevent the contents of one bag passing over to the other. The oxygen tube is considerably expanded above, so that the nitrous oxide tube may pass up through its middle. Oxygen thus travels along the circular channel left between the tubes, whilst nitrous oxide passes along the inner tube. The space left between the nitrous oxide tube and the expanded oxygen tube, is closed in by two circular plates, the upper of which revolves by means of a handle upon the lower, which is fixed. The upper plate has 13 holes in it, and the lower has a long slot. Now when the handle is turned, so that the upper plate revolves, one or more holes can be brought over the slot in the lower plate, and be thus rendered available for the passage of oxygen. When the indicator, for instance, points to "4" on the dial, four holes are opened for oxygen, and nine are closed. *By this plan, a very small increment or decrement in oxygen is represented by a very considerable excursion of the indicator along the dial plate.* Notwithstanding that I have made a large number of experiments with the object of ascertaining what percentages of oxygen pass through these holes, I find it impossible to give any reliable averages, owing to the variations in pressure, which must to some extent occur in the bags during the administration. All that I can say is, that when both bags are kept partially distended, and one hole is open, a very small percentage (something between 3½ and 6½ per cent.) of oxygen will come through, and that each additional hole turned on represents something like an additional 1 per cent. or 1½ per cent. of oxygen. In actual practice, all we require is an apparatus which will allow of very small increments and decrements of oxygen. Should one bag ever be allowed to become fully distended, the regulating apparatus will, of course, fail to work as such. If one bag be allowed to become more distended than the other, the percentage of its gas will, of course, be higher than when the bags are of equal size. The apparatus here described allows (1) air, (2) nitrous oxide, or (3) nitrous oxide mixed with a proportion of oxygen, to be freely respired through valves at the will of the administrator.

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* Messrs. Barth & Co., of Poland Street, Oxford Street, who have most patiently constructed various forms of apparatus for me, are the sole makers of hat which I now use.

Before commencing the administration, the anæsthetist should make sure that he has a sufficient supply of the two gases in the cylinders. In the next place, it is important not to charge the bags till immediately before the inhalation. The face-piece should be one which is capable of being applied to the face with the utmost accuracy, as a want of co-aptation, which, in the case of nitrous oxide alone would not be detrimental, would, in the case of the mixture, be likely to lead to partial or complete failure. The valves of the apparatus should work efficiently and freely. After passing a small quantity of the gases through the bags, in order to free them from all traces of air, the anæsthetist should turn off the two-way stop-cock, and place the oxygen indicator at "0." Both bags should now be filled to about one-half with their respective gases, and the face-piece applied. Air will now be breathed freely through the apparatus, and the sound of the acting valves will prove that the face-piece fits well. The patient should be instructed to breathe freely and moderately deeply, "in and out through the mouth." This is important, for as he commences to breathe, so he will probably continue when the mixture is admitted. When the administrator sees and hears that breathing is free, and not till then, he should fix the oxygen indicator at "2" and turn on the mixture at the two-way stop-cock. Nitrous oxide with a small percentage of oxygen will now be breathed. After a few seconds, the oxygen indicator may be turned to "3" and in a few seconds more to "4." In children, anæmic subjects, and debilitated persons, the indicator may be moved to "3" and "4" more quickly than in strongly-built or alcoholic individuals. During these manipulations, the two bags must be kept as nearly as possible equal in size. It is rarely, if ever, necessary to replenish the oxygen bag during the administration, but the foot must be constantly kept on the nitrous oxide key. Considerable practice is necessary to keep both bags equal in size throughout. Should phonation, laughter, excited movement, or struggling assert itself, the administrator should withhold more oxygen for the present, or even give less of this gas, by turning back the indicator for a few breaths. In forty or fifty seconds from the commencement of the inhalation, the indicator may usually be got as far as "5," and in twenty seconds or so more may be allowed to point to "6," "7," or even "8." Generally speaking, it is not advisable to give more oxygen than this. The administrator must judge from the symptoms of the patient the extent to which oxygen should be given. It is impossible to formulate any definite rules as to the extent to which this gas should be admitted. Considerable practice is necessary, not only to get the face-piece to fit, with extreme accuracy and to keep the bags *half distended*, but to know when to give more, and when to give less oxygen. The analysis of my last 153 dental administrations, together with a careful study of the five illustrative cases in the table, will, perhaps, be of service in this connection. Whilst too much oxygen will be likely to induce laughter, excited movement, stamping, screaming, &c., and whilst it is right, should such symptoms appear, to give less oxygen, the anæsthetist must be careful not to proceed too far in the opposite direction. In regulating the increase or decrease of oxygen, we must reckon what the *future* effects of any procedure will be. For example, if some phonation occurs, we should give somewhat less oxygen for a short period, but not necessarily till the phonation has ceased. We may usually turn back to the previous proportion of oxygen *before the symptoms of excitement have actually subsided*, knowing that they will subside in obedience to the lessened proportion of oxygen admitted several seconds previously.

Of the 162 administrations which I have conducted with the last-mentioned apparatus, 153 have been in dental practice. By the kindness of Dr. Cockburn Smith, Mr. George Rowell, and numerous house surgeons and students—to all of whom I now beg to express my very great indebtedness—I have been able to obtain good notes of most of these 153 cases. Whenever time and opportunity permitted, I adopted a plan which was suggested by my friend the late Dr. C. E. Sheppard, whose loss we must all so deeply deplore. A métronome was used and was set to ring its bell every third second. One assistant counted aloud at each bell, whilst another took notes on ruled forms at my dictation. From the five illustrative cases which will be given later on, it will be seen that I was thus enabled to obtain records of the effects produced by variations in the proportions of oxygen and nitrous oxide.

An analysis of the 153 dental cases of this series, gives the following results:—

(1) *Sex.*—123 females; 29 males; 1 not stated.

(2) *Age.*—Oldest patient, 61 years; youngest 7 years.

(3) *Typical cases, i.e., cases with good colour, no "jactitation," or "stertor," more or less complete muscular relax-*

ation, and quietude during operation. These numbered 117 *i.e.*, 76.4 per cent. of the total number.

(4) Of the 36 *atypical cases*, 20 showed variable degrees of lividity, but were otherwise typical; 10 were rigid, but otherwise typical; 1 showed lividity with rigidity; 1 lividity with very slight clonus; in 2 cases the ordinary symptoms of nitrous oxide were accidentally allowed to appear; and 2 cases were intentionally terminated by nitrous oxide free from oxygen.

(5) With regard to the *signs of readiness for operation:* deducting the 4 cases which were terminated by nitrous oxide itself, and 12 cases in which the notes on this point are imperfect, we are left with 137 cases for examination. Of these 137 cases in which notes were taken as to signs of readiness, it is stated in 104 that the conjunctival reflex was absent. In 9 cases this reflex was not abolished, but there was either softly snoring breathing, or muscular relaxation to testify to good anæthesia being present. In the remaining 24 the conjunctival reflex was not noted, but other signs were relied upon. Of these 24 cases 4 displayed widespread muscular rigidity with an increasing, though not inconvenient, tendency for the head to come forwards or to the side; the administration being discontinued at this point, a good anæsthesia always followed. In 19 the character of the respiration, or the relaxation of muscular system afforded good indication of proper anæsthesia. In one case only was there a slight tendency to "jactitation," and in this the patient was known to be peculiarly susceptible to nitrous oxide itself.

(6) *Phonation* was noted in 29 of the 153 cases; but it was usually not excessive. In 8 cases it occurred during the administration only; in 8 during extraction only; in 6 after extraction only; in 4 throughout the administration, extraction and afterwards; in 2 during the administration and

extraction; in 1 during extraction and afterwards. Violent screaming was met with in 2 of these cases only.

(7) *Muscular excitement, struggling or kicking* were observed 8 times only. (Rigidity is not reckoned). In 5 cases slight movements in the chair were stopped by giving less oxygen; in 1 case kicking occurred during extraction; in 1 there were movements of legs during and after the administration, the former being easily controlled by more nitrous oxide; and in 1 resisting movements were made early in the administration, but soon subsided.

(8) With regard to the 4 *cases terminated by nitrous oxide itself.* In two of these too much oxygen was given to start with, and this error could only be corrected by a rapid increase of nitrous oxide. In one of the other two, nitrous oxide came in with an unexpected rush from its cylinder. In the other I had allowed the oxygen bag to become too full, so that more oxygen than was expected came through the holes; and evidences of excitement coming on I at once finished successfully with nitrous oxide.

(9) *Period of Inhalation.*—This was taken accurately by the métronome in 67 cases, and works out as 110.5 seconds on the average. The longest inhalation was 186, the shortest, 66 seconds.

(10) *Available period of resulting anæsthesia.*—This was taken by the metronome in 69 cases. The average works out as 44 seconds. The longest anæsthesia was 80; the shortest 21 seconds.

(11) *The number of teeth or roots extracted* was recorded in 129 cases. The average works out as 2.7 per patient.

(12) *Pain.*—Patients were always questioned as to pain. With the exception of 3 cases, every patient denied the slightest pain. In one of the 3 cases, however, it is questionable whether any was really felt. Of the remaining 2 cases,

in one of them (No. 735) the patient certainly felt the last tooth, but the operation lasted 66 seconds, so that in the preparation of the averages I have entered 60 seconds anæsthesia instead of 66. In case No. 794 the anæsthesia was very perfect, but was of insufficient duration for the extraction of a very difficult wisdom tooth. Although no pain was felt in case 781 the patient was conscious of the removal of the last two stumps.

(13) *After effects.*—There was retching in one case, and a transient feeling of nausea without retching in another. Recovery is not quite so speedy as after nitrous oxide alone.

In 69 of the 153 cases the métronome was used and very full notes taken. I, therefore, give in a tabular form, five of these métronome cases. Each one illustrates some point or another. Those interested in the subject will thus be able to see at what intervals oxygen was turned on, as well as the effects which more or less of the gas produced.

D.—General Remarks on the Anæsthesia produced by Nitrous Oxide and Oxygen administered at Ordinary Atmospheric Pressures.

From the foregoing facts, it will be obvious that patients vary a good deal in their behaviour under nitrous oxide in the presence of oxygen. In most cases, a very satisfactory and tranquil anæsthesia, free from "stertor," "jactitation," cyanosis, and excitement, results. These may be termed typical cases (see Case No. 699 in table). Of the last 153 administrations in dental practice, 117 were typical. On other occasions we meet with symptoms midway, as it were, between those of the typical cases and those of ordinary nitrous oxide cases. We may find, for example, that it is necessary to give less oxygen than usual, and, therefore, to produce a slight degree of duskiness; or the patient may be rigid throughout and not relaxed, as in the typical cases; or a certain degree of phonation and excited movement may occur; and lastly, in very exceptional cases, we may be obliged to resort to the undiluted gas in order to finish the case satisfactorily.

The symptoms of the patient will, of course, largely depend upon the proportion of oxygen which is used; with large percentages we shall not obtain good anæsthesia, but shall meet with hilarious excitement, laughing, screaming, gesticulation, stamping, struggling, &c. With smaller percentages, such as those advocated in this paper, we shall in the vast majority of cases obtain tranquil or softly snoring breathing, a florid colour, a good though rather accelerated pulse, more or less complete muscular relaxation, an insensitive conjunctiva, and a fixed condition of the globes. With smaller percentages still, the colour of the features will be a trifle dusky, the breathing rougher and more audible, but still quite regular, the pulse more acclerated, and the pupils larger. Should the percentage of oxygen be still further reduced, the colour will be dusky, the breathing irregular and jerky, the peculiar "stertor" or snorting sound already described will be heard, and muscular twitchings will be witnessed—in other words, we shall have all the phenonema of an ordinary nitrous oxide administration. Jerky breathing and muscular twitchings are never met with except when the percentage is small, or when this gas is wholly absent.

In order to successfully administer oxygen with nitrous oxide, considerable care, watchfulness, and attention to detail are indispensable. A great many points have to be borne in mind during the administration. No fixed percentage of oxygen will answer in all cases, and the percentage must be varied in accordance with the behaviour of the patient. I find it best to commence with a mixture containing a somewhat smaller percentage of oxygen than that which may be subsequently given. If we commence with a large proportion of this gas (10-12 per cent.) excitement will be not unlikely to arise. By starting with, say, 5 or 6 per cent., consciousness is destroyed with sufficient rapidity, and the chance of intoxicating effects is less than if a larger proportion had been allowed. The objection to giving pure nitrous oxide itself at the beginning is that it is sometimes difficult to quickly neutralise the effects thus produced without going to the other extreme, and administering too much oxygen. The accurate fitting of the face-piece is a matter of the highest importance. I once met with unmanageable excitement from an ill-fitting face-piece, but on subsequently administering the same percentage of oxygen with an accurately adapted face-piece perfect anæsthesia resulted. In administering the mixture silence should be maintained, and the patient should be left perfectly undisturbed. I have more than once seen excitable movements initiated, even in the middle of an administration, by touching or raising the arm of a semi-anæsthetised patient. I have already referred to the importance, in using the apparatus last described, of preventing any distension of the bags. The behaviour of the patient must be watched with the greatest care, in order that we may observe and appreciate the significance of every symptom displayed. We have to pilot our patient along a narrow channel. On the one side we wish to avoid the clonic respiratory movements, &c., which prevent a free and lengthy intake of the anæsthetic ; and on the other any inconvenient signs of incomplete anæsthesia. We must be sparing in our addition of oxygen in the case of those patients whose appearance suggests that they will be likely to require what we may call, for want of a better term, a strong dose of the anæsthetic. Patients who are easily affected by anæsthetics—such for example as children and debilitated persons of both sexes—may invariably be anæsthetised by nitrous oxide with a considerable percentage of oxygen ; and as such patients are prone to "jactitation" and a short anæsthesia, the mixture has great advantages over the ordinary gas.

When I first drew attention to the advantages of this mixture of gases I was unable to definitely mention the signs of true anæsthesia. The appearance of the patient in typical cases is such that it is difficult to believe that anæsthesia is really present. From the experience of the last two years, however, I may say that the gases should, as a rule, be administered until the conjunctival reflex has disappeared. Should this sign persist for a considerable length of time, other symptoms must be relied upon. Amongst these are complete muscular flaccidity, a fixed condition of the globes, and softly snoring breathing, such as that met with in good chloroform anæsthesia. In a few cases I have met with muscular rigidity, but the subsequent anæsthesia has been very satisfactory. When a very long anæsthesia is desired the inhalation should be kept up for some little time after the signs of narcosis have appeared ; for, within reasonable limits, the longer the administration, the longer will be the resulting unconsciousness. The use of oxygen is particularly advantageous when a long anæsthesia is required ; for by its presence nitrous oxide may be passed through the patient in far larger quantities than would otherwise be practicable.

At the first application of the forceps, the patient anæsthetised by this mixture often displays slight reflex tonic movement in the chair. This, however, is rarely, if ever, inconvenient, and as a rule quickly subsides. Reflex phonation during operation is far less frequently met with than in the case of ordinary nitrous oxide.

In a considerable number of instances I have administered nitrous oxide *per se*, and nitrous oxide with oxygen to the same patient on different occasions. We learn a great deal from these comparison cases, and I therefore propose to briefly refer to a few of them.

On two occasions I gave nitrous oxide to a lady 29 years of age. She was very tall, thin, of nervous temperament, and of dark complexion. Though she felt no pain, she experienced each time a most distressing and horrible "night-mare." The sensations were so vivid that her mother wished she should take ether for a subsequent dental operation. Against our advice, ether was given, and I administered it to very deep anæsthesia. A good deal of nausea, malaise, &c., followed. A further operation being required, the patient, although she dreaded the unpleasant dream under nitrous oxide, preferred this to the malaise of ether. Without permitting her to suspect any difference in the administration, I gave her oxygen with the nitrous oxide, and, as before, left her quite quiet after the extraction. The first thing she said was that she had not experienced any unpleasant sensations. She was astonished, and asked for an explanation. On carefully questioning patients who have inhaled oxygen with nitrous oxide, I find it quite exceptional for any distressing dream or sensation to have been experienced. This may account for the less frequent screaming under the mixture. At the Dental Hospital we find the greatest difference in this respect. Whilst it is not at all an uncommon thing for the majority of a batch of patients to scream violently during extraction under ordinary nitrous oxide (although no pain is experienced), it is quite the exception for anything more than slight phonation to be heard during operations under the mixture. It seems as if by the use of oxygen a somewhat deeper anæsthesia is rendered possible.

I have noticed a better colour and less depression after the mixture than after nitrous oxide itself. I gave the latter gas to a boy of 15 on one occasion. He was put deeply under, and two teeth on the same side of the mouth were removed. Without saying anything as to the change of procedure, I administered oxygen a week or two later. Good anæsthesia followed ; two teeth were removed. The father of the boy and also the surgeon noticed after the operation that the boy had a better colour than he displayed on the former occasion, and the boy himself said he felt better.

But the principal advantages of the mixture are those which affect the operator. I have given the mixture rather recently to two patients with very large tonsils. To one of these, a little girl, nitrous oxide had been administered in the ordinary routine of practice at the Dental Hospital a week previously. The house surgeon reported that when the patient was well under gas, she was much convulsed, her back became arched, her breathing temporarily arrested, she slipped down in the chair, and the operation was impossible. The child took the mixture well (Case 733), passed into the typical anæsthesia, and three teeth on opposite sides were removed. There was no difficulty in breathing or alteration of colour.

There can be no doubt that oxygen is specially useful in children in preventing "jactitation ;" and is more especially useful in such cases as these. The tongue and adjacent parts do not appear to become nearly so swollen as with ordinary nitrous oxide—another point for the operator to bear in mind, an enlarged and swollen tongue is often very inconvenient to the surgeon.

Furthermore, I have often given nitrous oxide and oxygen to patients, who, on previous occasions, have shown such susceptibility to the pure gas, that it had been found difficult to secure anything but a very short anæsthesia. Now, in such cases as these, the addition of oxygen to nitrous oxide seems to me to be extremely useful. Several months ago, I administered nitrous oxide in the ordinary manner to a female domestic servant, about 25 years of age, of very florid colour and good general physique. She was rather nervous, but not more so than the average patient. To my surprise, I found that after about twelve breaths of the gas, she displayed marked "stertor" and even more marked "jactitation." The movements were so inconvenient, that the operator had to wait a few seconds for them to subside. A very short anæsthesia with screaming followed. No pain was felt. I gave her nitrous oxide again on a subsequent occasion, and exactly the same symptoms occurred. On three subsequent occasions I administered oxygen with the gas, and with marked benefit. Not only was it possible to prolong the period of inhalation to almost any desired degree, but the resulting anæsthesia, though still somewhat shorter than is usual, was two or three times as long as it had been with nitrous oxide alone.

The following figures, obtained by the use of a métronome in one of these comparison cases, may be of interest. The patient was a healthy young woman of 23 (Case 541). With nitrous oxide and oxygen, she quickly passed into the typical state. Inhalation eighty-four seconds ; resulting anæsthesia, fifty-six seconds ; two teeth extracted ; no pain ; no reflex movement or phonation. Subsequently I administered nitrous oxide in the usual manner. The inhalation took forty-eight seconds. Two teeth extracted. The second tooth was removed at the twentieth second after the withdrawal of the face-piece, and at this point she screamed. The anæsthesia was reckoned to be twenty-four seconds.

With regard to the use of this mixture in patients suffering from visceral or other diseases, little need be said. Of the cases in which I have myself administered oxygen with nitrous oxide, I have never seen the slightest approach to any dangerous condition, and I have taken all patients indiscriminately.

I have given the mixture to a patient with advanced morbus cordis, and to one or two with pulmonary affections of a serious nature. I once anæsthetised a patient who, about a quarter of an hour previously, had fainted two or three times during the attempted extraction of a tooth without an anæsthetic. When I gave her the mixture, her pulse was very small and feeble, and her face quite blanched. She had had no stimulant in the meantime, and was placed vertically in the chair. I gave somewhat more oxygen than usual (Case 713). There was no excitement; the pulse and colour greatly improved as the inhalation proceeded; the administration lasted ninety-six seconds, and the resulting anæsthesia was of sixty-three seconds duration. The patient's normal colour was completely restored at the termination of the operation.

I also have notes of a very feeble patient, to whom I gave gas with a small quantity of ether a few years ago. The ether was added because the circulation was so depressed. The operation was successfully performed, and without any pain, but the pulse was so weak afterwards, that the patient had to be placed on a sofa for some time. Subsequently I anæsthetised her with nitrous oxide and oxygen, and the circulation—not only during the administration, but afterwards—never showed the slightest sign of flagging (Case 408).

Though I have not administered the mixture to any very old patients, I feel convinced that it would be preferable to nitrous oxide itself, as less stress would be thrown upon respiration during the inhalation owing to the presence of oxygen.

Between the time of reading this paper and correcting the proofs, I have given the mixture with much advantage to two patients of 71 years of age; and I shall certainly continue to employ oxygen in such cases.

With regard to the after effects I cannot speak quite so favourably as I could wish. Speaking generally, we may say that the larger the quantity of any anæsthetic given, the longer will be the time taken for the effects to pass off. Whatever may be the disadvantages of ordinary nitrous oxide, we must all admit that it has one great point in its favour, viz., that the return to perfect consciousness after its inhalation is, with the rarest exceptions, remarkably quick and satisfactory. The speedy return to intellectual activity is connected with the short period of inhalation. As already indicated, we possess in oxygen a vehicle for nitrous oxide—we can introduce any desired quantity of the anæsthetic into the circulation of the patient. But the long period of inhalation thus rendered possible has its drawbacks. Although this prolonged inhalation leads to a longer available anæsthesia, it necessarily also entails a more tardy return of the normal faculties than in the case of nitrous oxide alone. Thus patients are not able to leave the chair quite as quickly as under ordinary circumstances. A feeling of drowsiness and disinclination to move may often be observed. If the patient attempt to walk immediately after the operation he will be liable to exhibit more unsteadiness of gait than is usual after nitrous oxide free from oxygen. Nausea, retching and actual vomiting, although very rare, are certainly somewhat more liable to occur than after the usual administration of nitrous oxide. It is difficult to speak positively upon this point ; and further inquiry is needed.

E.—CONCLUSIONS.

So far as my experience has gone, I am inclined to regard the use of oxygen with nitrous oxide as of distinct advantage in the large majority of cases in dental practice. But we cannot shut our eyes to the fact that the administration of the mixed gases involves more time, more attention to detail, and more skill than are essential for the employment of nitrous oxide in the ordinary manner ; whilst the risks of unpleasant after effects are a trifle greater. It them follows that unless we can show that the gain is considerable, we are hardly justified in advocating any departure from the usual lines of practice. I have attempted to point out that in many instances this gain is considerable, and for my own part I shall certainly continue to use the mixture in preference to ordinary nitrous oxide for such cases. But when a very short operation has to be performed upon a patient who has taken nitrous oxide itself on a previous occasion with the best results, when any additional preparation might alarm a nervous subject, or when time is a matter of great consideration, the use of nitrous oxide *per se* is possibly preferable to that of the mixture. I need hardly remind you that it is not always an easy matter to prophesy the duration. A tooth which is looked upon as easy of removal often gives trouble, and under these circumstances an additional fifteen or twenty seconds in the anæsthesia may make all the difference in the result of the case.

By the use of the apparatus brought before your notice, an attempt may be made in every case to secure the satisfactory form of anæsthesia which has been described. Should the case turn out to be an exceptional one, nitrous oxide alone can at once be substituted with the best results. In this way every case may be brought to a successful issue. The extra trouble incurred by having a bag full of oxygen in communication with the ordinary nitrous oxide apparatus is very small, whilst the benefits that will result in the majority of cases from the addition of a proper proportion of this gas are very great.

The mixture is to be chiefly recommended, as preferable to nitrous oxide itself—

(1) In children :

(2) In anæmic and debilitated patients :

(3) In any one who has previously exhibited great susceptibility to nitrous oxide, and has remained a very short time under the influence of the gas :

(4) In patients who, under nitrous oxide itself, have experienced unpleasant sensations.

(5) In patients very advanced in years, and in those suffering from such serious visceral disease that ordinary nitrous oxide seems unadvisable.

In conclusion, I feel that I must tender you my best thanks for having so patiently listened to this communication. I can only hope that others will give this plan of producing anæthesia an extensive trial, and thus throw fresh light upon the subject.

THE STRATUM UNDER THE ODONTOBLASTS, DESCRIBED BY WEIL.*

By Prof. Partsch, Breslau.

In his meritorious work, " Contributions upon the histology of the tooth-pulp," Weil has called attention to the fact that the odontoblasts are not always continuous with the pulp, but that the pulp processes of the odontoblasts are interlaced into a fine net-work, which, since it only contains scanty cellular elements, appears as a separate stratum between the odontoblasts and the pulp, when seen under the microscope.

Von Ebner (Histology of the teeth, including Histogenesis, Scheff's Handbook of Dentistry, Vol. I. p. 237,) holds that this stratum is an artificial production. " One sees nothing of this stratum in sections of teeth carefully decalcified, on the contrary, a peculiar mesh, rich in cells is found just under the odontoblasts. A suspicion is raised that this stratum, destitute of cells, is an artificial product brought into existence through shrinkage of the inner part of the pulp, which is due to the complicated preparations for the preservation of the enamel which Weil made use of in his research."

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* Communicated to the Central Association of German dentists at Hanover, on April 21st, 1892, and published in *Deutsche Monatsschrift fur Zahnheilkunde*, August, 1892.

Röse agrees with the same view in a paper in the *Deutsche Monatsschrift für Zahnheilkunde,* Feb. 1892, under the heading, "Histology of the Tooth-pulp." He writes, page 42 :—"In opposition to the statements of former authors, Weil describes a stratum, between the odontoblasts and the pulp proper, which is free from cells, about 20 to 40 mikra wide, and which is formed of interlaced extremely fine fibrils. In sections of teeth carefully decalcified, one does not find such a layer." Page 44 :—"As the odontoblasts firmly hold together with the dentine, and the central part of the pulp contracts, so naturally the shrinkage must appear strongest at the periphery of the pulp. The cells (in reality the odontoblasts) become distorted centrewards, only the more firmly uniting web fibrils, the off-shoots of the odontoblasts to the pulp-cells, show resistance ; they become indeed stretched, but not broken. In this way, an artificial product arises, which Weil calls a stratum." A further passage in Röse's work is not quite harmonious with this view. Page 47,—"Like the pulp-cells, the odontoblasts have also got off-shoots, and, certainly ordinarily, only a single one at the base, by means of which they are connected with the pulp. If one wishes to call the whole of this mass of processes a stratum, like Weil, that is a mere matter of taste. At any rate, this layer, which at the most is only $\frac{1}{10}$—$\frac{1}{20}$ of the thickness of Weil's figures could not have any sharp limits towards the pulp. I cannot, however, make up my mind to speak here of a distinct stratum, as that could only bring about confusion." There is here clearly a contradiction. One cannot declare something to be an artificial product, as not really existing, the existence of which one must admit in principle, though only to a small extent.

Est—aut non est. It is either there, or not there. I do not venture to give a decision on Weil's method. I would only do so if I had imitated it as exactly as the author has contrived to do. However, every reader of Weil's book must recognize the great pains he has taken, and ought not to reject the method as deficient without very careful scrutiny, in face of the hitherto existing lack of means affording us a microscopical examination of the pulp in connection with the dentine. I succeeded in finding a new mode of decalcification (shortly to be published) which in the most delicate way imaginable, permits of rendering the soft and hard parts of the tooth *in situ* accessible to microscopical examination. I have preferred the embedding in celloidin, because embedding in paraffin necessitates warming the preparations, which inevitably results in a shrinkage of the tooth-cartilage (Dentinknorpels). That a satisfactory preparation depends upon the proper fixing of the tissue elements in quite fresh specimens, I presume is well known.

But may I call attention to one point respecting the choice of material which appears to me peculiarly full of significance in face of Mummery's publication (*Philos. Trans. Roy. Soc. Vol.* 182). One must not think that the pulp of every tooth, which on its outer surface presents no sign of disease, is completely sound, or is to be looked upon as completely sound. Very frequently irregularly placed healthy teeth are extracted. Whenever I have made a section of such a tooth, I have found in it, with extremely few exceptions, a pulp which cannot be called normal. Almost always it presented the indications of a net-formed atrophy, and showed distinct whitish discolouration, many spaces (*Bläschen*), wide empty vessels, and nothing of the injection or the reddish tint of the normal pulp. The exterior of the tooth does not allow one to conclude with certainty that there is a normal state of the pulp. It is therefore somewhat difficult to get possession of unquestionably healthy pulps of human teeth. The scarcity of material, however, has not the least influence in determining me to submit to your decision some preparations taken from the lower bicuspid of a boy thirteen years of age ; by the removal of an epulis, the neighbouring second premolar became so loose that its extraction appeared necessary. After hardening in Müller's fluid, and afterwards in alcohol it was decalcified, embedded and cut into successive sections. Fig 1., low power, shows the crown at its widest part between the cusps and the neck of the tooth. There is a narrow bright streak which extends beneath the dark nucleated odontoblasts, between them and the pulp-cells. The breadth of the margin varies between 10-12 mikra. With a higher power it shows that the apparently bright homogeneous zone consists of an entanglement of the finest irregularly crossed threads, which are spun out between the odontoblasts and the uppermost layer of the cells forming the pulp. I have not been able to observe a direct connection of these threads with the finest expansion of the nerves. On the contrary the fibres appear opposite the red-tinged nerve threads as transparent as glass. This stratum is not absolutely free from cells. Here and there an odontoblast exists, dislodged downwards, which projects with its cornified (körnigen) cell-body and its dark nucleus from its surroundings. Sometimes also an isolated pulp-cell extends into this stratum. I have not with certainty met with round cells, leucocytes, in the stratum. But what characterises this stratum as a distinct anatomical layer is the fact that a net-work of vessels ramifies in it. One notices, as shown in Fig 2, that from the pulp-vessels which rise up perpendicularly to the stratum rectangular branches commence which now spread along in it. One can often trace them as long streaks. Their endothelia, like the blood corpuscles contained in them, are distinctly perceptible ; their course is continued straightly without break or diversion which a shrinkage would occasion. Here and there transverse sections of vessels are noticed in the bright stratum...... As I have mentioned above I have also found the stratum of the pulp processes of odontoblasts in many other preparations ; I have not found any instances in which it was wanting. As these preparations were taken from diseased teeth, I will here leave them out of consideration, as the question now is with regard to the anatomical existence of the stratum. I also abstain for the present from any explanation as to the function of the layer. One can reflect upon the comparison with the basement membrane of the mucous membrane, one can conceive them as distinct vessel-carrying strata, but all these explanations are idle so long as the anatomical researches are not constructed on a broader basis. According to the preparations which were at my disposal, the stratum described by Weil is not an artificial production. I incline to this opinion from the fact that in preparations which are obtained by the freezing microtome there occasionally takes place a tearing or breaking off of the pulp layer from the dentine where the odontoblasts do not remain sticking to the dentine as one would think according to Röse, but remain in connection with the pulp and allow the before mentioned stratum to be recognized most distinctly amongst them. On the whole the sharp demarcation, the regularly diminishing contour contradicts the view that it comes into existence through an irregular contraction of the tissues.

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LONDON, SEPT. 1st, 1892.

SCHOOL CHILDREN'S TEETH.

In chronicling passing events of interest to the Profession, we have occasionally briefly alluded to the question of dental appointments at Schools, and our excuse, if one is needed, for referring more fully to the subject lies in the fact that just now it has been brought forward rather prominently by the address of Sir J. Crichton-Browne which we recently published, and which has received an extremely extensive notice on the part of the Press throughout the country. We would appeal to our readers to bear in mind the principal points, so that as opportunity offers they may bring their influence to bear, in the proper quarters, and be ready to support a movement which will not only confer a benefit upon the present and future population, but also tend to promote a just recognition of the claims of the dental profession to range itself side by side with the main body of that great army continuously employed, to the utmost of its power, in a strenuous struggle with Disease. From the copy of a Report sent by Mr. R. D. Pedley to the Board of Management of the South London Metropolitan School District it appears that the mouths of 1985 children have been examined at the Sutton School and the condition of the teeth systematically recorded. The total number of temporary teeth requiring attention is 2,991, and from a proper standpoint of treatment the filling of about two-thirds of this number would benefit the individual children's health. Altogether there were 1173 permanent teeth requiring filling and between the ages of six and twelve, inclusive, it seems that there are 758 carious permanent teeth which should be saved, nearly all of them 6-year old molars. Out of the whole number of children there are only 527 who required neither fillings nor extractions. This proportion is certainly much better than that observed in several other schools which have been recently examined and the explanation suggested in the Report is somewhat curious and deserving of attention. It appears that in this particular school the Medical Officer examines all the children's mouths and extracts all those teeth which he regards as hopelessly bad. A special table in the Report shows that in 148 of the children 256 permanent teeth had been extracted. We are disposed to agree with the remark that, under the circumstances this treatment is beneficial ; the removal of such carious teeth for which no conservative treatment is to be provided may perhaps be justified on prophylactic grounds, especially when the disease is active or far advanced. But the securing of a hygienic mouth from a microbic and fermentative point of view is not the only thing to be thought of, and Dr. Talbot, in the last number of the *Cosmos*, has recorded his opinion that the routine extraction of permanent teeth from one generation to another before the osseous system has been fully developed is bringing into existence a race of individuals with small jaws. Apart from the continued irregularity and crowding, which such a process maintains, it is sad to reflect that these youngsters should be deprived of such important organs when a systematic and skilled attention can secure their retention for the after years of life.

One of the most important points in the Report we are considering is mentioned in the suggestions made for remedying the present condition of things. After recommending the appointment of a duly qualified Dental Surgeon, at £150 per ann., to attend two days a week, it is urged that a careful record should be kept of all operations performed at each visit, so that a return can be obtained showing the proportion of teeth stopped to the number of teeth extracted. It is possible, as our readers know, to save the teeth during childhood ; properly managed children make good patients, especially when grouped in large numbers, as in a school, and with a wholesome, but not unduly severe discipline. Certainly we must admit that the conservative operation demands more time, to say nothing of skill, than the sacrificial one, and therefore an increased remuneration ; but surely this element is one which will not need phillipics when once the claim which these unconscious children have to just treatment is recognized by those standing *in loco parentis* Many an able young dental surgeon will compete for such posts when a fair salary becomes an established accompaniment, but at present the honorarium is apparently regarded as sufficient when nothing more arduous is required than the extraction of teeth. We would suggest that the present holders of such appointments form some kind of association which would bring them into communication with one another, and allow of an interchange of ideas from the scientific as well as the more strictly professional aspect.

If the multiplication of appointments on the present unsatisfactory basis be a matter for congratulation it can only be so when taken as an indication that something is being done, that it is but the commencement of a more extensive advance in the future, and that the unmitigated extraction of teeth in the present generations of children will give place to, or at all events be modified by, the employment of conservative efforts later on. To assist this evolutionary process the education of responsible authorities is the main thing and we can, for the present, imagine no more successful method of attacking head quarters than by the presentation of such a Report as we have drawn attention to.

THE DENTAL PROFESSION.—A surgeon writes to the *Lancet* complaining of the advertising by some dentists. He appears to grant that "the dental branch has been recognised and accepted as part and parcel of the medical profession," and is much concerned that those in authority should put a stop to the unprofessional practice of advertising in the lay press. He does not absolutely declare what authority is referred to, and this, indeed, is not the only vague point raised in the letter. From a reference to the action of Colleges towards their diplomates, the writer apparently overlooks the fact that the men who advertise continuously, are not under the control of any College, but have been registered by virtue of the recognition of existing interests when the Act was passed. When occasion arises, the Colleges do "interview" dental diplomates, and withdraw diplomas for the very offence complained of. At the same time, the writer does not appear to be aware that an unregistered person is quite as much prevented from styling himself dentist, as he is from representing himself as a surgeon or physician. Again, whilst complacently regarding the strictly medical position from the lofty pinnacle of anti-quackery, the *Lancet* correspondent is discreetly silent upon the short-comings of some of his brethren; for we hear complaints that surgeons and physicians have not been sufficiently careful in their selection of dental surgeons as collaborators. The general practitioner has many opportunities of assisting in the direction pointed out in the *Lancet*, but unfortunately, through lack of interest, or of power to appreciate the position, he, too frequently not only aids irregular practice by his apathy, but directly maintains it by active association. The surgeon writing his complaint, is on the right track, and if he continues his researches, and increases his information, he will perhaps address his next letter to his colleagues, instead of to "those in authority." Curiously enough, the same number of the *Lancet* contains another correspondent's complaint, that in the higher ranks of medical practice, there is a disposition to use the fashionable newspaper as a medium of announcing one's whereabouts. When the Medical Act was passed, it was some time before the natural disappearance of the "unprofessional" element took place. A similar evolutionary process is going on in the dental branch, and the survival of the fittest will result.

A Doubtful Charity.—In the Exhibition Park at Vienna there is a section of the Viennese Volunteer Aid Society always present. According to the last year's report, recently published, this extremely beneficial undertaking derives no aid from the State or Corporation and is only kept going, financially, by means of continual begging, and a perpetual appeal to the public. But, according to an account in the *Journal fur Zahnheilkunde*, it would seem as if one portion of the public, at all events, appreciates the existence of the Section in the Exhibition Park. Everybody who desires medical assistance, is attended to gratuitously, and some time ago it happened that a visitor to the Exhibition was seized with violent toothache. It occurred to her companion to take her to the "Aid Society"; there the tooth was quickly extracted, and the lady returned in good spirits to enjoy the Exhibition. The case soon became known, and, since then, the dental doctors of the section have to give continuous attention to visitors. The public have made the matter a formal "business." One is spared the unpleasant and costly visit to the dentist, and simply goes to the Exhibition, and there pays 40 kreuzers (8d), or on Sundays and holidays, 6d entrance fee, has the bad tooth removed by the dentist of the volunteer Aid Society, and after this double relief, gives himself up to the pleasures of the shows and entertainments which the Exhibition affords. There does not appear to be a record kept of the proportion of these bad teeth which should be filled instead of extracted, but perhaps a "mechanical" department will be added to the section.

Actinomycosis.—Where this disease affects the lung, the symptoms may resemble some forms of tubercular disease, but the actinomyces may frequently be found in the sputum and a diagnosis made. In all probability, the germ in these cases is first taken into the bronchi, but when the neighbourhood of the jaws is the seat of the disease, there is reason to regard an unhealthy condition of the mouth and teeth as a source of danger. In a case quoted in the epitome of the *British Medical Journal*, the ulcerative form was noticed in a strong man of 52, who had no trouble except with his teeth, many of which he had lost. Three months after his last visit to the dentist, a swelling appeared near the angle of the jaw, followed by two others in the direction of the mastoid process. They were distinct from the lymphatic glands which were scarcely affected. The swellings were not painful, and on being opened, a little pus, mixed with yellowish granules, could be squeezed out. The internal structure of the tumours showed a mesh-work, and the diagnosis of actinomycosis was confirmed by the microscope. It was considered that the mouth, rendered vulnerable by the condition of the teeth, was certainly the point of entrance.

THE THERAPEUTIC TOUTING MACHINE.—Professor Gairdner of Glasgow has recently raised a protest against a system which he thinks is perverting all our therapeutics and lying at the root of biassed judgment. An apothecary in London, or a physician in New York, keep urging upon us combinations of remedies used by themselves, and any medical man has merely to send an attestation that he has tried this remedy in numerous cases and always found it effective, to secure that his name will get all over the world. The Professor points out that the great evil consists in the possibility of a man being able to successfully push some advertised remedy, whether absolute trash or even dangerous is not of the slightest consequence, and then before there is time to find out if it is good, bad, or indifferent, he will have made his money if the thing has been properly worked. It is of far less consequence that the remedy should be good, than that it can be well touted. It is too much to expect that this protest will abolish this money-making exploiting of the profession and the public, but the outspoken opinion of Professor Gairdner will serve as a note of warning to unthinking people, and do good.

Death from Chloroform.—A patient at Netley, aged twenty-one, much broken down in health, was to have an abscess opened for hip-joint disease. Barely two minutes had elapsed from the commencement of the inhalation before death occurred from cessation of respiration. The heart beat feebly for some few seconds. Dr. Dudley Buxton in opening the discussion on anæsthetics at the meeting of the British Medical Association, pointed out that fright possibly acted in some cases in human beings as a cause of death, but never among the lower animals; reflex inhibition of the heart among human beings possibly occurred, but never in the lower animals; mechanical impediment to breathing probably acted both in the lower animals and in man. Direct action of chloroform upon the heart was demonstrable in man and in the lower animals; in the latter, the actual dilation could be seen. When death recurs during operation, much of the fore-going also applies, but shock, hæmorrhage, and operation, seem to have less effect upon the lower animals than in the case of man. Dr. F. Hewitt agreed with Dr. Buxton's conclusions and thought that manyof the phenomena of chloroform inhalation constantly met with in human beings were not produced when looked for among the lower animals.

The British Institute of Preventive Medicine.—This Institute, similar in character and purpose to those in Paris, Berlin, and St. Petersburgh, has been registered under the Company's Act, 1867, but as its objects are purely scientific and charitable, it has been allowed to dispense with the usual affix, "limited." It is governed by a Council composed of thirteen gentlemen, representing Biological, Chemical, Medical, Veterinary, and Agricultural Science, and four nominees of the members of the Institute. Amongst the objects for which it is founded are the investigation of the means for preventing and curing infective diseases of men and animals, and providing a place for researches; to give instruction to medical officers of health and others; and to prepare and supply special protective and curative materials. It is expected that £120,000 will be required for building and endowing the Institute in London, and an appeal is now being made for funds. There is already a promise of £20,000 provided the Council raise £40,000 for land and buildings. Several substantial sums appear in the preliminary subscription list, and the Royal Society and the British Medical Association have passed such resolutions of approval as are indicative of promises of financial help. It is pointed out that although the Council hope for some help from the State in the future, they must rely entirely upon private generosity for the present. The Chairman of Council is Sir Joseph Lister; Sir Henry Roscoe is Treasurer, and Dr. Armand Ruffer, 19, Iddesleigh Mansions, S.W., the Secretary.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—Mr. F. G. Hallett, whose connection with the College has given him exceptional opportunities for the task, has compiled a catalogue of the busts and portraits in the possession of the College. He has also added a short biographical notice to each which renders the work very much more interesting, and justifies the author's hope in "an endeavour to give as complete a record as possible of the appointments held by those who have assisted in creating the history of the College." The Council has fixed the price of this publication at half-a-crown.

THE MATTEI INVESTIGATION COMMITTEE.—Dr. G. W. Potter, the Chairman, narrates, in the *British Medical Journal*, the course of watching five patients, certified by competent surgeons to be suffering from cancer, who were treated by the Mattei remedies and "without the knife." The cancer curers found themselves between Mr. Stead and the Committee. "If they persisted in refusing every case sent in, Mr. Stead must expose them in the *Review of*

Reviews ; if they accepted cases which they could not cure, the believers in open and honourable methods of medicine, whose criticism the Matteists themselves had demanded with such well-simulated earnestness, would equally expose their failure to the light of day." The five patients were kept under observation for a year, which the Committee thought long enough to show any definite changes taking place. The Matteists, however, suggested that, as the treatment would be very prolonged, and the members of the Committee would be inconvenienced, and the report delayed, it would be better for the Committee to see some old cases, said to have been cured previously, and report upon them. This second attempt to escape was not successful, and according to Dr. Potter's account, the cancerous growths all continued to progress exactly as if no treatment whatever had been used. Then one of the smaller medical papers questioned the expediency of the investigation, and the Matteists contended that one of the conditions laid down had been broken, by the Committee publicly explaining the circumstances of the case. They declined to continue the treatment of the patients under the observation of the Committee. Dr. Potter says there are no medical aspects of any kind in the Mattei treatment, and alludes to Mr. Stokes's analysis of the "electricities" when they gave no other reaction than that of distilled water.

MENTON DE GALOCHE.—We have received a reprint of a paper, read by Dr. Magitôt recently, upon the facial deformity popularly known by the above expression. It is really what we call an "underhung bite," and the author points out that the condition may be due to mal-development of the upper maxilla, rather than to undue protrusion of the lower. The case he mentions was treated by means of an "inclined plate."

Abstracts of British & Foreign Journals.

OBSERVATIONS UPON THREE CASES OF PSEUDO-ALVEOLAR ABSCESS DUE TO TEETH WITH LIVING PULPS.

By Dr. HUGENSCHMIDT, Paris.

THE third case was the most interesting, as the author had the opportunity of following the evolution of the abscess step by step. The patient was a young girl of seventeen, first seen in 1889. The right upper central had been filled five years before, and was in perfect condition. She was treated for a dental fistula in connection with a second upper bicuspid and sent away for six months. Before this time had expired, she returned complaining of pain, a vague irritating sensation, in the right upper central. On examination the author found at the end of the root, a small, very hard, projection, having all the physical characters of a commencing alveolar abscess. The tooth not being very sensitive recourse was had to the classic mixture of equal parts of tincture of iodine and aconite, used as a counter-irritant. Applications of this made the pain, and what sensitiveness there was, disappear, without, however, influencing the size of the little tumour. The tooth kept quiet for some months, but when the patient returned in February, 1890, to have the mouth examined, it was found that the small tumour had increased in size, and was as large as a pea, but, as there was no pain, nothing was done. Two months later, in April, 1890, the little gathering broke, and allowed a small quantity of pus to escape. The author then felt convinced that he had to deal with a tooth with a dead pulp, and opened into it; but in this case, as in the others mentioned, as soon as the layer of enamel was cleared, the patient complained of great sensitiveness and a quick response to the application of hot and cold liquids. Being convinced that this tooth was the origin of the abscess, the author drilled into the tooth as far towards the pulp as possible and applied arsenious acid. The next day the tooth was still sensitive, so an injection of cocaine under the gum was resorted to, which allowed the pulp cavity to be reached. As soon as the drill was withdrawn a drop of pus appeared at the opening, soon followed by blood. In spite of the cocaine the pulp was sensitive, so an injection of the drug was made directly into the pulp cavity, and this allowed the contents to be withdrawn painlessly. The extirpation was followed by a free hæmorrhage, explained by the large mass of the pulp and the great size of apical foramen. The extracted pulp showed a small ulcerative lesion at the lower part, about a millimetre from the coronal end. The following day the canal having been cleaned with bichloride, 1 in 500, was filled with naphtol in glycerine, and from that time the tooth was completely cured. Here, then, it seems, are three typical observations of alveolar abscesses originating in a living tooth, the seat of a chronic suppurating localized pulpitis.

The lesions of the pulp have been studied with much care, and pointed out by Dr. Arnim, of Buda-Pesth (*Patho-histologie der Zahnpulpa und Wurzethaut, Zubovrach Vestnik, St. Petersburg*, 1889, ix. 108-122, and Transactions of the International Dental Congress at Paris, 1889, p. 108.) This author divided pulp lesions into :—" 1st, Partial acute pulpitis ; 2nd, Partial acute purulent pulpitis ; 3rd, Complete acute pulpitis ; 4th, Chronic complete and suppurating pulpitis. The first is due to an inflammatory process which commences under the layer of odontoblasts and only extends a very short distance ; this inflammation is characterised by a cell infiltration, and is probably due to micro-organisms. The second form is an ulcerative process which also destroys the layers of odontoblasts, and which, according to the duration of the attack, extends more or less deeply into the layers of the pulp tissue. If this second form lasts a long time it becomes complete acute pulpitis. Lastly, chronic complete and suppurating pulpitis is a chronic condition commencing at the centre of the pulp and gradually extending towards the periphery."

It is to be noticed that this author does not mention the existence of a chronic, localized, suppurating pulpitis, which is certainly the lesion causing alveolar abscesses in the cases mentioned in the above communication. This chronic, localised, suppurating pulpitis does not present very clear clinical characteristics. In order to make a diagnosis there are only the three following facts :—1st, the presence of a chronic alveolar abscess or a dental fistula on the gum, at a point corresponding to the end of the root of a tooth ; 2nd, a more or less deep colouration of the crown of the tooth when compared with its neighbours: 3rd, the indication bythe patient that this tooth is the seat of irritation, of a pain, or obscure trouble at the time of the formation of the abscess. If the neighbouring teeth are not dead, one should not hesitate to open up the tooth in question, in spite of any sensitiveness of the dentine or pulp which may be met with. The author thinks we may conclude from the facts observed :—1st, That a *living* tooth may be the origin of a dental fistula or alveolar abscess arising from the pulp ; 2nd, That this pulp lesion is a chronic, localised, suppurating pulpitis ; 3rd, That a dental fistula arising from a living tooth can only exist when the foramen is sufficiently large at first to allow the products of the local suppuration to escape, and thus avoid the strangulation of the pulp which would be inevitable if there were an inflammatory lesion of the pulp with the normal filiform apical foramen, unless the pulp cavity were in communication with the outside in the mouth in consequence of penetrating caries.

Revue Odontologique.

THE LOST ART OF MASTICATION.

All coarseness has been removed from food, and by the new processes made possible by mechanical as well as scientific discoveries, cereals are reduced to the finest of flour, while the hulls, which contain the phosphates essential to bone-building and also furnish the material for mechanical grinding by the jaw, are entirely excluded. There seems to be a growing inclination on the part of the human race to use that class of food which requires little if any mastication. This evolution will eventually result in the adoption of new modes of acquiring and preparing food,—viz : the manufacture of foods in the chemical laboratory. Indeed, at the present time, many forms of food comprising all the nutritive elements necessary to sustain life for the sick, are being prepared in the laboratory. If these foods prepared in a liquid form are sufficient for the nourishment of children and the sick, it seems reasonable to expect that they will soon become the exclusive food of the laboring class, and indeed of all classes. Such being the case, the art of mastication, which is now at a very low ebb, will then become entirely lost.

Dr. Talbot in the Cosmos.

A PLEA FOR EXTRACTION AND REPLANTATION.

By John S. Marshall, M.D., Chicago.

Obstinate alveolar abscess is usually the result of a crooked root or an abnormally small root canal, making it impossible in either case to remove or render innocuous the retained septic material; or perforations of the root made in attempts to open small root canals; or erosion of the apical end of the root; or the presence of broaches, filling material, or dressings which have passed the apical foramen; and accompanied to a more or less persistent discharge of pus, either through the external or internal plate of the alveolar process, or through the alveolus at the neck of the tooth. Occasionally cases will be found in which no discharges are present, but instead, a chronic induration of the surrounding tissues, or, as in the superior teeth, the discharges may find their way into the antrum of Highmore or the anterior nasal passages, and possibly mislead the surgeon. These teeth are usually sooner or later condemned as worthless members of the body, and are removed.

It is in this class of teeth that a majority may be rendered healthy and useful for an indefinite period.

It is perhaps hardly necessary to say that replantation is only admissable in the anterior teeth, including the bicuspids. The molars are capable of being replanted only in exceptional cases, when there is fusion of the roots and they assume a conical form, and occasionally a lower molar, where the roots are perpendicular to the crown.

It will be generally conceded that attempts to cure *in situ* such cases as those just mentioned usually prove unsuccessful, and that eventually the teeth are lost. This results from the fact that such operations are largely, *per force*, only guess work. If the root is curved more or less acutely, it is difficult and often quite impossible to follow the canal with the broach; or if the canal is abnormally small, the finest broach may not enter it at all. Drilling is unsafe; and under these conditions the various antiseptics and liquid filling materials are unsatisfactory, because they do not always penetrate to the end of the canal, and consequently septic material remains in the root and keeps up a constant irritation.

In cases of erosion of the apical end of the root, amputation of this portion *in situ* is rarely successful in curing the disease, owing to the difficulties in smoothing the stump and perfectly filling the apical foramen. The same may be said of attempts to plug perforations of the sides of the roots.

In those cases where broaches, filling materials, or dressings have passed the apical foramen, diagnosis is difficult except by trephining the alveolar plate, and this has no advantage over extraction and replantation.

Roughened surfaces and foreign substances are not kindly borne by the tissues which surround tho roots of the teeth. It is therefore imperative that all such hindrances to a return to a normal condition be reduced to a minimum.

For these reasons it would seem preferable to extract and replant such teeth if they do not speedily prove amenable to treatment by the usual methods ; for, with the tooth in the hand, the root can be minutely inspected and any eroded portion amputated, and the surfaces finely polished. The root-canal can be reamed out and cleansed without fear of perforating its sides, the canal filled and the apical foramen, or a perforation plugged with gold and carefully finished, and the whole thoroughly sterilized.

None of these operations are possible with the same degree of perfection while the tooth is *in situ ;* they must be more or less imperfect ; and just in that degree will they produce irritation, and the more serious inflammatory processes.

The question might very properly be asked, Are the operations of replantation and transplantation of freshly extracted teeth having the pericementum attached, founded upon physiological law and sound surgical principles? The author answers, Yes : quite as much so as are the operations of skin and bone grafting, and no one condemns these. Union with the tissues with which they are placed in contact is the result of the same vital processes ; the surgical conditions are nearly identical in each of them, and success is as certain in the one as in the other, provided the same aseptic conditions can be maintained until union is complete. Failure of replanted teeth to unite with their alveoli is much less common than with transplanted and implanted teeth. The immediate cause of failure in replanted, transplanted, and implanted teeth is usually suppurative inflammation, induced either by mobility of the tooth which constantly breaks up the attachment of the plastic exudate, or septic conditions of the tooth or its alveolus at the time of the operation or inoculation ; afterward from a filthy condition of the mouth.

The failures which occur later, viz : after attachment has taken place, are more difficult to understand. In these cases the surfaces of the roots are attacked by the osteoclasts and gradually honeycombed ; or masses of tissue are dissolved at various locations, leaving large cavernous excavations with sharp edges ; suppuration accompanies or follows the work of the osteoclasts ; the tooth becomes loose, and is sooner or later expelled from the jaw as a foreign substance.

Perhaps these phenomena are due to irritation induced by a septic condition of the dentine, resulting from decomposition of the organic material contained in it, and in the form of a gas or effluvium it penetrates the cementum, and, coming in contact with the pericementum and surrounding tissues, sets up this retrograde metamorphosis.

There are certain individuals for whom it would not be wise to undertake the operation, viz : those suffering from general anæmia, tuberculosis, and syphilis. Such people are never good subjects for surgical operations, as their tissues are very irritable. They do not as a rule heal readily, and are prone to suppuration and sloughing, consequently replantation, transplantation, and implantation, if performed upon such persons, are likely to prove unsuccessful.

We are all no doubt interested to know the character of the union which takes place between the root of the replanted tooth and its alveolus, but so far it has not been positively demonstrated. Applying the methods employed in physical diagnosis to these cases, we find that percussion gives the most marked signs. Taking the percussion-note of normal teeth, produced by striking the tooth with a steel instrument, as the standard of pitch, we find that as inflammatory conditions of the alveolus advance the percussion-note becomes lower and duller, while, on the other hand, as these symptoms subside the note assumes a clearer and higher pitch. This lowering of the tone is doubtless the result of a thickening of the pericemental membrane, and its increased vascularity.

The percussion-note given by a large percentage of replanted teeth a few months after the operation, or when union is complete, is much clearer and higher pitched than that of the adjoining teeth. This is more noticeable in the superior than in the inferior teeth, on account of the greater resonance of the superior maxillæ.

These facts would seem to indicate that a bony union takes place in these cases between the root and its alveolus. It would also seem probable that the locations at which this ankylosis would most likely occur would be where the pericementum had been destroyed, or the cement-tissue partially removed. In other cases the percussion-note is normal. This would indicate normal reunion of the pericementum with the alveolus; but when the percussion-note is lower and duller, it would be certain evidence of an indurated pericementum, or other inflammatory symptoms.

In conclusion, the following facts are mentioned as necessary to insure success in these operations:

First, exclude anæmic, tubercular, and syphilitic cases.

Second, secure thorough aseptic conditions of the surfaces of the root and pulp-canal, by washing and immersing in bichloride of mercury solution 1 to 500 of water.

Third, amputate and smooth all eroded surfaces, but sacrifice as little of the pericementum as possible. This is very important.

Fourth, hermetically seal the pulp-canal and apical foramen, and any perforations that may exist, with gold fillings.

Fifth, curette the abscess cavity, remove the blood-clot from the alveolus, and wash both with the bichloride of mercury solution before replanting the tooth.

Sixth, secure immobility of the tooth by a ligature or an interdental splint, until union has taken place.

The Dental Cosmos.

THE PATHOLOGY OF THE TRIFACIAL NERVE.

By Arthur B. Freeman, M.D., D.D.S., Chicago.

The pathological conditions implicating the trifacial may be classified in two divisions according to the location and origin of the lesion, namely central and peripheral: those of the former being paralysis, including intra-cranial tumours affecting the origin of the nerve-roots, and idiopathic neuralgia; while those of peripheral origin are neuritis, symptomatic neuralgia, migraine, pulpitis, pericementitis, infantile eclampsia of dental origin, and some other minor affections. Eminent authorities cite the causes of paralysis of the fifth nerve to be :—1. Disease within the pons, hæmorrhage, softening, tumours, sclerosis injuring the tissue at the level of the origin of the nerve-roots. 2. Disease at the base of the brain, especially by tumours, chronic meningitis, and carious bone. 3. Predisposing causes situated in the course of each of the three divisions. The first, in the wall of the cavernous sinus from foreign growths, aneurism of the internal carotid and also within the orbit from foreign growths, such as orbital cellulitis or inflammations ; the second and third divisions in the spheno-maxillary fossa, which is often invaded by tumours, either osseous or from the parotid gland. 4. Traumatic injury, especially punctured and bullet wounds, through the mouth and nose.

The chief symptom is the loss of sensation throughout the distribution in severe cases, and loss of sensation in the skin in milder cases,—universal when caused by tumour in the brain-centre, and confined to areas of distribution when confined to any particular division. The loss of sensation is usually preceded by sensations of irritation, sharp, darting, burning pains, referred to the region of distribution, closely resembling those of neuralgia and often accompanied by tender points in the course of the nerves. If the disease is rapid, these symptoms are absent, anæsthesia is the first symptom. Tactile sensibility is usually lost first. The muscles of the face are insensitive, but are not weakened, though frequently the action of the muscles is slower in responding to irritation. The mucous membrane becomes insensitive, and there is a lack of sensation and reflexes when the conjunctiva is touched. Odours cannot be detected perfectly. Ammonia or snuff fail to irritate the mucous membrane of the nose at first application. Anæsthesia of the mucous membrane of lips, mouth, and tongue up to the middle line. Furred tongue on side affected, and loss of taste, are frequent symptoms. The secretion of the lachrymal and salivary glands is lessened, and therefore a dry eye and mouth results. Inflammation of the eyeball are frequent ; the cornea becomes cloudy, then opaque, and ulceration follows, probably due to irritation of the fifth nerve and not to foreign bodies. Herpes zoster is a frequent symptom, accompanied by much pain and hyperæsthesia. The motor symptoms are a lack of masticatory force, recognized by placing fingers on the temporal and masseter and allowing the teeth to be forcibly closed, when feebleness or absence of contractions will be present. When the lower jaw is depressed, it deviates slightly toward the affected side, because in the depression the external pterygoids draw the condyles forward, and this movement occurs only on the unaffected side. Ultimately the patient is unable to open the jaws to the full extent. The differential diagnosis from neuralgia is easy when complete paralysis is present, and difficult when the disease causes only sensory symptoms not unlike neuralgia. Persistent hyperæsthesia of the skin is more marked in paralysis than neuralgia, and the pain radiates less frequently to other nerve regions of distribution. Loss of taste is an important differential symptom from neuralgia, also absence of irritation on application of ammonia and other pungent drugs, sensitive conjunctiva, anæsthesia, and absence of motor symptoms.

Neuralgia is defined as severe pain produced by irritation of a nerve, or by sympathetic action, with inflammation of surrounding tissue ; a disease chiefly of debility, overwork, and general depression. When occurring in the head it is termed tic doloureux. Two classes of neuralgia are distinguished : "symptomatic," in which the pain is a symptom of organic disease of the nerve, or brain tissue, and "idiopathic," in which the malady consists only of functional disturbance. The term neuralgia should be restricted to the idiopathic variety, as it is manifestly unreasonable to describe inflammations of nerve or brain tissue as "neuralgia" when it causes much pain and few other symptoms, and as "neuritis" when other symptoms predominate over pain. But a distinction of the two forms of nerve pain is often very difficult in practice. Sciatica has been described as neuralgia, while the pain is generally the result of neuritis. In ascertaining the clinical history of neuralgia, it is of great importance that only cases should be used in which the primary organic lesion of the nerve-trunk or centres can be excluded with reasonable confidence. This limitation does not, however, exclude peripheral organic lesions, as pulpitis and pericementitis. Such cases are classed among neuralgias, and are very different from those in which a primary lesion of a nerve-trunk causes local and limited pain. Essentially, neuralgia is a disease of adult life, being rare before puberty, also rare in extreme old age. Women are more prone to the disease than men, and frequently it is hereditary. It occurs in so-called "eccentric" or peculiar temperaments, usually of the nervous diathesis, or those who are anæmic, excitable' anxious, worrying, and often irritable.

Among the exciting causes of neuralgia, impairment of the general health takes the first place, either from overwork, mental or physical, over-lactation, prolonged fatigue, over-stimulation of the eyes, severe emotion, traumatism, exposure to cold, irritation of the nerves near the periphery, alcoholism, malaria and other toxic influences. The one great symptom is pain, spontaneous, paroxysmal, unilateral or bilateral.

What is the nature of nerve-pain without a known organic cause? First, spontaneous pain, and secondly, hyperanæsthesia are the symptoms of neuralgia. Spontaneous pain means the action of sensory nerve elements apart from local external stimulation. The pain corresponds to certain peripheral nerve-areas, and therefore we must look for its cause to the elements constituting its peripheral nerve-structure. These are the nerve-fibres, the peripheral end organs, and the central cells with which the fibres are connected. To which of these can be ascribed a functional activity independent of external stimulation?

There is no evidence to show that, apart from external stimulation, the nerve-fibres are capable of independent function. We are thus reduced, by exclusion, to the central terminations of the nerve-fibres as the source of pain in idiopathic neuralgia, as these central nerve cells, so far as known, are the only elements capable of the independent evolution of nerve-force. The conclusions of physiologists show that the sensation of pain depends on a special function of nerve-cells, there being separate structures for the sensation of pain and touch, and it is claimed there is no difference between the structure of sensory and motor filaments,—that one may do the work of the other,—all depending on the central connection or their nerve cells. We must therefore regard the pain of idiopathic neuralgia as central, as due to the spontaneous activity of the cells that constitute the central termination of the nerves. If we regard this form of neuralgia as a result of over-action, the discharge of the central nerve cells, to what is this over-action and discharge due? Probably to hyperæmia of the centre and dilatation of the vessels, as vaso-motor disturbance means deranged action of the vaso-motor centre for the territory.

Among the second classification of the diseases affecting the "trigeminus" we will first consider neuritis. The nerves seem to be peculiarly exempt from the inflammatory process, as in suppurative inflammations they are found comparatively intact, while the surrounding tissues are infiltrated with pus. Nevertheless both acute and chronic neuritis have been satisfactorily proved of late years. In acute neuritis the nerves are swollen, reddened, and more succulent than normal. Microscopic examination reveals hyperæmia, ecchymoses, serum, and migrated white blood-corpuscles in the interstitial tissue between the nerve-fibres. Large granular corpuscles may also be present, while the fibres may be little changed, or their medullary sheaths may be broken up and the fibres undergo degenerative atrophy. Chronic neuritis is characterised by increase of interstitial tissue and consequent compression and degeneration of the nerve-fibres. The nerve is firmer than normal, usually diminished, and of a greyish colour. This inflammation may affect only a small portion of the nerve course, or may extend from the primary lesion, either centrally or peripherally. Neuritis seated in a sensory nerve gives rise to pain extending along its course, perhaps to the periphery, and subsequently there may be anæsthesia. Of symptomatic neuralgia very little more need be said. It is, as already stated, a pathological condition due to neuritis of nerve or brain-tissue, and occurs most frequently in one of the three divisions of the fifth nerve, but usually occupies two divisions simultaneously and the three very seldom. The affection in the first division is felt chiefly in the supraorbital branch, while the pain radiates from the supraorbital notch over the anterior half of the head, eyeball, eyelid, and side of the nose. Points of tenderness are supraorbital, palpebral, nasal and ocular, within the eyeball. This ocular pain occurs independently of defective refaction, and may exist alone or be accompanied with pain is associate parts. In neuralgia of the second division the pain radiates from the infraorbital foramen over the cheeks and side of the nose. When the third division is affected the pain extends over a large area, occupying the parietal eminence and temple, the ear, lower jaw, and tongue, while the points of tenderness cover these regions. Vasomotor disturbances are noticeable, flushing, sweating, and salivation. Radiation of pain is marked, originating in one division, passing to a second and frequently being reflected to the brachial plexus on the same side. The radiation of pain is ascribed to the extension of the "central discharge" to adjacent nerve-centres, but the reflex pain is that pain which exists only at a distance from its cause. Pathological conditions inducing this form of neuralgia may be exotosis of the bony plates at the foramina of exit, tumours along the course of the nerve, caries of teeth, or traumatism.

Migraine or paroxysmal headache is an affection characterized by paroxysmal nervous disturbance, of which headache is the most constant element. It is commonly accompanied by nausea and vomiting, and often preceded by sensory disturbance, especially disorder of the sense of sight. The pain is frequently on one side of the head, and thus the term "hemicrania" or "sick-headache" has been applied to the malady. Those of high intellectual development are, as a class, those who most frequently suffer, but the disease has a larger percentage among females than males. The periods of life most susceptible to the affection, are late childhood, puberty, and early adult life. Migraine has strong hereditary tendencies, as in more than half the cases inheritance can be traced, and it is usually direct. Influences which depress and weaken the nervous system directly or through the general health, such as excessive brain-work, over-fatigue, anæmia, over-lactation, etc., are productive in exciting the paroxysms, as well as excitement, dietetic errors, and over-use of the eyes. The essential symptom is headache of a paroxysmal nature, nausea and vomiting, some disturbance of vision, frequently vaso-motor derangement, causing flushing, perspiration, etc. The headache varies much in degree, but is seldom trifling. It usually has a characteristic course, uniform in the same patient; it begins gradually, slowly increases to a considerable degree of intensity, and after a variable time subsides, sometimes slowly, sometimes rapidly. The nature of the pathological condition is rather a matter of inference than demonstrated morbid change, as no anatomical change is known to underlie the phenomena. Two chief theories are held regarding the pathology or origin of the attacks. One is based on the disturbed circulation in the brain, due to the dilatation of the arteries by the vaso-motor nerves, causing increased arterial tension and increased tension on the membranes to which sensory filaments of the fifth are supplied. According to the other theory of the disease, the derangement is in the central nerve cell. It is as difficult to explain the primary derangement of the cells of the vaso-motor and sympathetic centres as it is to explain that of the cells in the sensory centres of the brain, but we know that the function of the pneumogastric is secondarily affected in the later stage of the attack, which in a measure substantiates the latter theory.

Infantile eclampsia occurs in young children with great readiness, and has many causes. The special liability of infants to convulsions is probably due to the imperfectly developed condition of the nervous system. It is probable that functional capacity is only fully developed after structural development of the nervous system is complete. By far the most potent cause of this disease is "rickets," and the period at which rickets chiefly occurs, is between the sixth and eighteenth month of life. This corresponds with the most active period of dentition, and it is very probable that in many cases this process of dentition has its influence, as it involves irritation of the sensory nerves and so may excite the convulsion.

The Dental Cosmos.

SOME OF THE RESULTS OF THE EARLY EXTRACTION OF THE SIXTH YEAR MOLAR.

By W. B. Conner, D.D.S., Akron, O.

It is popularly supposed that after this tooth has been extracted, that the second molar moves forward, and occupies its place. This is not altogether true, and here is where a mistaken theory has been misleading. In every case of early extraction of the first permanent molar the change that takes place in the jaws is contrary to the popular theory advocated.

There is no force brought to bear upon a second molar that would cause it to move forward. The second molar is held in its normal position by its antagonist, and does not move forward, instead, the change is wholly anterior to the same, and comprises a retrograde movement of the jaw. The roots of the sixth year molar penetrate the true maxilla to about one half their entire length ; when extraction is resorted to, the lesion involves not only the process, but far into the jaw proper. We have exactly the same condition as we would find in a shaft bone, where fracture has taken place, only in a less degree. What would be the result if a fracture of a shaft were not supported by splints during the knitting together of the parts? Would not muscular contraction distort that joint, and produce an unsightly and impaired member? If the rule applies to one, should it not also to the other? The part of the jaw implicated in extraction, is consequently weakened, and at an early age when the bones are yielding, is much more susceptible to the pressure of muscles than at a more mature age. The strongest and most unyielding part of the jaws, both upper and lower are posterior to the second bicuspids, but owing to the extent of bone involved in the extraction of this molar, it is made the weakest, and the muscular pressure brought to bear upon the anterior portion of the jaw, forces the superior jaw backward and upward, and the lower jaw backward and downward.

The author does not wish to convey the idea that such changes take place after the fifteenth year, but these observations refer to cases where extraction has occured prior to that time.

If the first molar is extracted before the second molar has erupted, we find the space closing up sooner, and to all appearances there has not been any retrograde movement on the part of the anterior teeth. But upon examination of the bite and jaws, we find a change, and a change not entirely at the expense of the jaw posterior to the lesion. It has been taught in colleges and journals, that we must expect the second molar to occupy the space left vacant, and our natural conclusion has been in harmony with these teachings.

It is contrary to all scientific reasoning to expect such a result, where extraction takes place at an age when the jaws are so yielding to the forces brought to bear upon them.

How often do we find a first molar moving forward to occupy the space left vacant after extracting the second bicuspid?

The author has never observed one such instance. Is it not just as lame an argument to advance as that of a second molar moving forward to occupy the first molars space?

Models were passed round, which were casts of his own mouth showing the arrangement of the teeth and changes which had taken place.

There was an absence of the first molars in both upper and lower jaws. The upper were extracted at about the tenth or eleventh year and the lower were left in the jaw until exfoliated, which was completed at the fifteenth or sixteenth year.

So the upper were lost before and the lower several years after the eruption of the second molars, bringing about the change presented.

There was in this case a decided shortening of the bite which is shown by the position of the occluding teeth, instead of an interlocking of the canines and the bicuspids, which was the normal occlusion prior to the extraction. The superior canines and incisors were striking directly upon the incisive surfaces of the eight anterior lower teeth, proving conclusively a determined shortening of the bite.

There was also a loss of the use of six bicuspids, the four superior and two inferior. In all cases the lower jaw is not interfered with to nearly the extent of the upper, after extraction, owing no doubt to the fact that the inferior maxillary bone is ossified earlier in life and is of a stronger mold and texture offering more resistance.

He maintained that the superior maxillary in this case had been shortened to the extent of the width of the missing tooth extracted, not saying anything about the constriction in the width of the jaw. The second inferior molar having erupted earlier than the superior, which is true in the majority of cases, gives it more prestige, having a firmer union with the jaw controlling the movement of its antagonist. The result was the holding of the superior second molar in nearly its normal position, thereby prohibiting an anterior movement movement but not a rotary movement. The forces brought to bear at this early age upon the superior teeth anterior to the first molar, might be regarded as insignificant. We observe iu our every day practice that the protrusions of the superior or inferior canines, if let alone, will in the course of a short time be adjusted to the arch and antagonistic teeth. The only force brought to bear is the weight of and contractions of the obicularis oris muscle with the assistance of the muscles of expression and mastication. If the bones and process is so yielding at the time ef the eruption of the canines, why should not the jaw be more so during the eruption of the second molars two years previous? There is no doubt that if such changes as above mentioned come about at the age of twelve that the jaws have not become fully developed, and adhering to the law governing repair, the destruction is always greatest in the direction of the least resistance. We have a retrograde movement in every case of early extraction of the sixth year molar. In the superior maxillary the molar eminence adds its marked features to the face, its consequent absorption, its dire effect upon the stronger expression. In every case of early extraction there is an entire loss of this protuberance and the muscles and surfaces over it become shortened and flattened with constriction of the face and in its vicinity. There is a depression at the alæ nasi and a sunken condition of the bones which occasionally extend to the floor of the orbit In the face of all the abnormalities produced, we have our journals full of this or that theory relative to the time when this tooth should be extracted. One writer claims the eighth year another the tenth and another the eleventh or twelfth, all for what purpose—to bring about a better arrangement and condition of the teeth and for the benefit of humanity in general. Nature has not produced as many irregularities as the early extraction of the sixth year molar has occasioned. Does extracting this tooth at an early age preclude all possibility of an overcrowded condition? Can we foretell the size, development and exact arrangement of the teeth and jaws far into the future? If such prophetic knowledge is possessed by a few, the whole profession should know it. Nature's plan of eruption is a most harmonious one. When the first molar is erupted it acts as an anchor or fountain to the arch, always in the proper place, and in the course of time the second molar erupts, reinforced as it were, in accordance with the eternal fitness of things. Now are we, as a scientific profession going to improve upon nature's plan by removing the foundation, and dictate our plan of constructing a human jaw? We should have not only one object in view when extracting, giving room for incoming teeth and temporary relief. The best safeguard a dentist can have is to preserve, if possible, all of the sixth year molars until that condition has come about when the bones of the face have become perfectly developed and features set—the second molars bicuspids and canines held in position by firm occlusion.

Then and not until then, is it prudent for the first permanent molar to be removed. Everything is conjecture and visionary when we extract this tooth at an early age, with such delusions as some authors advocate. Our observations, if closely applied, will not direct or advise such a precedure. The intelligence of the age demands of us all that our knowledge can avail, and it does not show that we are advancing when we resort to such practice as we have been taught to follow in the past. *Dental Register.*

NEURALGIA.

THERE is very little satisfactory, definite pathological literature on neuralgia even in medical works. We have more literature on paralysis than on neuralgia. When we get down to dental literature it all runs along the line of local pathology, and it is good. We will always have just as much suffering from careless operating as we have had in the past, so long as men are grasping after the almighty dollar. So long as dental colleges grind out students without thorough preparation, encourage them to enter college without preceptors, without any preliminary reading, take them through in two years and give them a diploma, just so long we will have a great many neuralgic affections caused by peripheral irritation.

Dr. Freeman, at the Chicago Dental Club.

ANSWER TO CORRESPONDENT.

R.G.B.—We know of a case where a M.R.C.S. made a similar application to yours, and was told he must go through the curriculum. We are presuming you refer to the English College, and in such a case it might be almost unkind to allow a Candidate to enter for the examination, unless he had prepared himself at a Dental Hospital. Under the circumstances there is no possibility of your application being granted.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Strert, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only, and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
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THE ADVANTAGES AND DISADVANTAGES OF GOLD AS A FILLING MATERIAL.*

By R. S. N. Faro, L.D.S., Eng.

Mr. President and Gentlemen,—The subject of my paper to-night is the advantages and disadvantages of gold as a filling material, and although I must apologize for calling your attention to a subject about which so much has hitherto been written and talked, yet as every day we have to make choice of what we consider to be the best material wherewith to fill the teeth which come under our care, and as our Students' Society here is constantly having new members added to its numbers to take the places of those who have left us, I think that if I am unable to tell you anything entirely new, yet it will be useful to be reminded of some of those facts which we know already.

And before turning our attention to the special properties of gold, allow me to recall to your minds what are the qualities of a perfect filling material, and we will then endeavour to find out to what extent the special material under consideration fulfils those desiderata. The qualities to be desired are :—

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* A paper read before the Student's Society of the National Dental Hospital.

(I.) That it shall be hard enough to resist mechanical attrition.

(II.) That it shall be able to resist the chemical action to which it shall be exposed in the mouth.

(III.) That after introduction it shall undergo no change of form or bulk.

(IV.) That it shall be non-irritant. All these gold possesses in a marked degree. The following desiderata of our perfect filling, however, gold is deficient in.

(V.) That it shall be easy to adapt to complex forms of surface.

(VI.) That it shall be a non-conductor of thermal changes.

(VII.) That it shall be of the same colour as the tooth structure.

In selecting a filling material for any individual tooth or cavity it behoves us to take into consideration :—

(1) The general condition of the mouth.

(2) The character of the teeth themselves.

(3) The position and extent of the Cavity.

(4) The age of the patient.

(5) The temperament and general health of the patient.

Before deciding whether we shall use gold to fill a tooth we should carefully examine the mouth ; should the other teeth be in good condition and the soft parts fairly healthy this will indicate the use of gold and in proportion as we find the other teeth defective, we shall judge that the tooth in question will prove no exception to its fellows and the use of gold will be contra-indicated. Nothing indeed is more vexatious to the operator than to find his stopping, on which he has bestowed both time and labour, in a few months surrounded by a crevice and in a few more drop out still in itself coherent, and to know that the failure was due not to want of skill but rather to defective nature of the tooth tissue.

The character of the teeth themselves must now be considered and in this connection I cannot do better than quote the words of Dr. Flagg, "In strong healthy teeth gold is the king of filling materials, but in proportion as teeth need saving, gold is the worst material we can use."

Thus in the case of semi-transparent, white, bluish white pearly teeth, gold is very often not the best stopping which could be employed although this is seldom found out and acted upon in any individual case until after the failure of gold plugs.

The same applies to rapidly decaying young teeth.

Teeth a little better in quality, according to the requirements of individual cases, we shall do well to fill with gold, either cohesive or non-cohesive, or both combined, tin, tin and gold, or plastics, as we deem best.

And lastly, we come to those large, dense, yellow teeth, usually associated with vigorous health and sound constitution, in which we may without fear of failure pack our gold filling, knowing well that it cannot but reflect credit upon our workmanship, and earn the gratitude of our patient. Such a tooth I have seen in the museum of the Exeter Dental Hospital, in which was a gold filling which had stood the wear and tear of 40 years, no flaw being visible even after that lengthened period.

With regard to the position of the cavity. Gold may be placed wherever it can be successfully packed, as the oral secretions have no effect upon it. But cavities of moderate size in molars, which are not sufficiently accessible for the insertion of a gold filling without the loss of a large quantity of sound tooth tissue, would, I think, be better treated by being filled with a good amalgam. Also, in very large cavities in molars and bicuspids, where the tooth wall is frail, I think it will be found better practice to insert an amalgam stopping than to endeavour to fill it with gold. For if we use the amount of pressure necessary for the thorough condensation of the gold foil we run a great risk of breaking or splitting off a portion of the tooth, and, on the other hand, if we do not apply sufficient force, the filling will certainly be a failure.

It is in this connection that the chief disadvantage of gold foil is constantly making itself felt ; I allude of course to the difficulty of manipulating it, whether it be in cohesive or non-cohesive form ; and as a consequence the amount of discomfort entailed to operator and patients. And first of all with regard to ourselves, the operators. To those who have spent many hours bending over a gold filling, the mere mention of the insertion of a large gold plug carries with it the idea of hard work, and very often of an aching back. The very nature of the work in which we are engaged and the compulsory position of body which has to be assumed very soon draws pretty largely on our powers of endurance.

In talking and writing about our operations on the teeth we very often leave out of our consideration the sensitiveness of the part affected, as though we were operating on mere blocks of ivory, but unfortunately very few of our patients regard the matter so stoically, and whether the filling to be inserted can be done without pain, or cannot, is generally a matter of some moment. Looked at in this light gold certainly does not appear to advantage, especially when the mallet has to be used on teeth where there is but a comparatively thin layer of dentine over the pulp, and where the cavity is too shallow to permit of capping, or when there is any periostitis present. From my own experience as a patient I certainly prefer hand pressure to the mallet. This brings me to the question of the respective merits of cohesive and non-cohesive foil, about which so much diversity of opinion exists. Laying aside the amount of discomfort to which the patient is subjected, for my own part I rather favour cohesive, or non-cohesive finished cohesively, above purely non-cohesive fillings. And for this reason; that, in my experience, at all events, I have generally found that in the same mouth in which are both hard and soft fillings, in similar positions, after a lapse of some months the surface of cohesive gold has appeared just as good as when the filling was finished, but that the non-cohesive surface has lost a good deal of its fine finish, and has shewn more signs of wear than its cohesive fellow. Certainly, gold when used cohesively is more generally useful than when in the non-cohesive state, and we are enabled to fill many cavities with it, which we most decidedly should not be able to do if it did not possess the property of cohesion. From an æsthetic point of view, large masses of gold in the front of the mouth are decidedly objectionable, although they may be rendered much less noticeable by rubbing the surface in a longitudinal direction with water-of-ayr stone.

In this connection, if its appearance has some disadvantages, it also has its advantages. Compared with amalgams, it does not change its colour; besides, that very golden appearance so objectionable when in undue prominence in the front teeth, has the advantage over every other filling material with which I am acquainted, of giving a living appearance to dead, that is to say, pulpless teeth, by shining through the walls of the cavity in which it has been placed.

Another point which we shall do well to consider before making choice of our filling material is the age of our patient. My own opinion is that to insert gold into the teeth of children under the age of 12 years is bad practice, and for these reasons:—1st. It is most important to retain the confidence of little patients, and I do not think that inflicting upon them the discomfort, not to say actual suffering, always more or less attendant on the insertion of gold stoppings will assist us towards the attainment of this end, and may have the effect of making them in after life refrain from consulting the dentist until perhaps it will be too late for any conservative treatment. The young are naturally restless and impatient, and the large pulps of their teeth with their imperfectly calcified dentine, render them additionally susceptible to pain.

2nd. On account of the structural defects of those teeth which have become carious, in a short space of time they require a filling which shall have if possible a positive preservative action on the tooth tissue, which gold certainly has not. Plastic materials, such as oxychloride and phosphate of zinc or, where a metallic filling can be used, a copper amalgam, will be found useful to carry the teeth along until the dentine has become richer in lime salts, and if we then contemplate the introduction of gold, our efforts will stand a better chance of being successful.

Lastly, we have to consider the temperament and general health of our patient. In persons of nervous constitution the teeth will usually be found more or less defective and possessing a more than average amount of sensibility; and as a natural consequence they will not be so well suited for the retention of gold fillings as the teeth of those of a more sanguine temperament which are generally of the dense yellow type.

In conclusion, I must thank you, gentlemen, for having listened so patiently to these remarks The subject we have been considering is a very broad one, and many points which I have only briefly touched upon would themselves afford subjects for many a profitable paper.

British Journal of Dental Science.

LONDON, SEPT. 15th, 1892.

THE STUDENT.

The improvement in the organization of schools and teaching which has taken place since the days of Mr. Robert Sawyer, and his colleague Mr. B. Allen, has been an important element in bringing about the change in the social status of the general surgeon of to-day. There is every reason to believe that the advent of a humane, thoughtful and conscientious general practitioner is being imitated by an analogue in the shape of a well-trained dental surgeon, drawn from the same class of the community ; and if it be true that the middle classes, and even the masses, have more of culture than formerly, it follows, "as the night the day," that the improvement in the mental calibre and ability of those devoted to the Healing Art will keep pace with the public demand, and prove acceptable in the time of sickness with its consequent distress. That these attributes can now be found combined with the cheerful, friendly *bonhomie*, not less acceptable, is due to some extent to the freedom from excessive restraint during the student career, and to the absence of undue interference with the formation of habits of self-reliance and independence. The period is one of considerable danger to the individual, and he who comes through it unscathed, is likely to make good material for the exigencies of after life. The curriculum, commencing with a preliminary proof of general education for both medical and dental students, is a test to the individual in more ways than one. A successful issue, with the name in the pass-list, may be taken to show that the candidate is not only possessed of mental ability, but that, at all events in the large majority of cases, he has been steady in his conduct. The acquisition of the knowledge which is thus tested by the licensing authorities, and which is to be placed at the disposal of his fellow-creatures can, ordinarily, only be obtained by a wholesome self-discipline carried out by the student. This bright side of the subject is thrown into stronger light by the failures which, happily, are the exception, and by the leakage which takes place in the number of registered students. A distinguished practitioner some time back took pains to ascertain the proportion of those who, having entered upon the study of the medical profession, failed, for some reason or another, to take a diploma, and the result was certainly surprising. This elimination of the unfit ones, due to the inability to adapt themselves to the more arduous environment, is of course the real factor upon which those reformers rely who are intent upon an extension of the results already obtained. For, in spite of the manifestly improved condition of the present, there are, naturally, to be always found those who consider that no effort should be wanting to ensure a continuation of the advance. Whilst some are in favour of increasing the strenuous character of the curriculum, commencing with a more stringent standard for the preliminary examination in general education, others seem more concerned in rendering the surroundings more conducive to a fortuitous result.

The Rev. A. S. Barnett, writing to the *British Medical Journal*, points out that the conditions of residence are as important as the conditions of study, and that lodgings are often depressing both to mind and body. He thinks the ideal arrangement would be for colleges to be opened in connection with centres of general study where students of art, literature and science could have their own rooms, and yet share a common life, and even take part in the management. Quite recently we have had the opportunity of reading the opinions, printed for private circulation, of a Brigade Surgeon Lt. Colonel, of the Army Medical Staff. He considers there is still a very great social wreckage of young men during their student life and the aim of his notes on the subject is to check such a deplorable process by disciplined supervision. Regarding medical schools as to a large extent private speculations, he looks forward to the time when the General Medical Council, as representing the State, will assume responsibility in such matters by an inspection of the teaching process, as well as of the examinations. The author considers the low standard of general education as productive of much evil and whilst the proposed measures, considered altogether, appear due to a view taken from a barrack-window, or a military aspect, there are some which, at all events at first sight, are pleasant to contemplate. For instance, a Country Residence for those not actually engaged in clinical work at the time, would constitute a substantial, but none the less enjoyable, alteration in existing methods. It is suggested that Anatomy and Physiology rooms near the country house would be beneficial on sanitary grounds, and that indeed most of the subjects, such as Chemistry and Materia Medica, of the 1st. and 2nd. years men could be taken at the Country College.

Whatever may be the outcome of such suggestions the arrangements now made for the training of the Dental Student are keeping pace with the spirit of the age. Besides the good work done in the Provinces there are now three schools in the metropolis, striving with healthy emulation to provide the necessary instruction, and so long as no more unworthy motives intervene the result must be beneficial. For those who also hope to take the conjoint or other additional diplomas it will now be necessary to extend medical and surgical work over five years, but perhaps, as was lately suggested by an authority on such matters, it may be found possible to allow one year to be spent in dental hospital work. With regard to more particular or minute points, interesting to intending dental students, there is not much to be said. Each should remember when once his hospital work has commenced that the attainment of the special diploma is fairly within view, and our advice can merely consist in a strong recommendation to steady work for the two years, as opposed to *laissez-faire* and a rush towards the finish.

New Method of Artificial Respiration.—Dr. Laborde, of the physiological laboratory at Paris, has described a new mode of procedure which is said to be very simple, and easy of application. A spoon, or the handle of a knife, is used to keep the jaws apart and to press upon the base of the tongue. The finger and thumb, covered with a handkerchief to avoid slipping, grasp the tongue, pull it forcibly out of the mouth, and then push it and pull it backwards and forwards, with a rhymical movement eighteen times a minute, until natural respiration is established. The respiratory reflex is stimulated by the traction on the tongue, and the excitation of its base. Dr. Laborde first thought of applying the method in man in consequence of finding it successful in the laboratory.

The Dental Profession.—The letter from a Surgeon to the *Lancet*, which we commented upon in our last issue, has called forth remarks from three well-known dental surgeons, whose views coincide with those we expressed. If there is no further result than to make general practitioners careful as to their relations with certain men on the Dentists Register, some good will have been done.

Review.

"Dissection Guides," By Thomas Cook, F.R.C.S.,
London: Longmans, Green, and Co; 1892.

As pointed out in the Preface this is a book of methods, and is to be considered as analogous to the "Handbook of the Physiological Laboratory." The author's name is well known in connection with the Anatomical School he has instituted, and which has been recognized by licensing authorities as a fit place for students to acquire a knowledge of an important subject in the curriculum. The experience obtained by dissecting and teaching for many years, has enabled Mr. Cooke to record in this book a systematic method of proceeding in the full dissection of the human body, and his prime motive appears to be the rendering of a laborious undertaking more interesting and easy than the average student is willing to consider it. If by following the directions given, a worker finds he is able to "dissect well and quickly," he will be ready to acknowledge his debt of gratitude to the author. We are inclined to recommend a study of the book to the dental student, believing he will derive benefit from such passages as deal, for instance, with the triangles of the neck, and the dissection of the head. One of the author's ideas is to keep the "part," as a "part," to be studied in its entirety, without unnecessary removal of the superficial structures.

Abstracts of British & Foreign Journals.

MICRO-ORGANISMS OF THE MOUTH.

By Jo. H. Linsley, M.D.

The prevention of dental caries depends, first of all, on strict cleanliness of the mouth, the importance of which can not possibly be over-estimated. Undoubtedly, good stiff tooth-brushes and plenty of clean water stand at the head of all measures of this nature. The next prophylactic means is the intelligent use of proper antiseptics. By far the most perfect germicide known, that can be at all employed in this connection, is the bichloride of mercury, but the use of this substance is not without danger. It should not be used as a wash for the mouth in solutions of greater strength than 1 to 2,000, and even then care must be exercised in its application. Other antiseptics which have been recommended for the oral cavity are salicylic acid, strength of 1:200, or 1:350 listerine, wintergreen oil, and like aromatic substances are suggested. In this connection might be noted the germicidal properties of tobacco, either the juice of the leaf or the smoke of the burning leaves. Certain it is, from results obtained by many experiments and observations, that tobacco juice, or smoke, very speedily destroys bacterial life, but the evil results of excessive indulgence in the "weed" more than counterbalance any possible benefits resulting from its antiseptic action on microorganisms of the mouth. In discussing the subject of infection, attention should be directed to the danger which exists from the spread of infectious forms of bacteria that are liable to be present in the mouth in various directions. It is not difficult, under certain circumstances, to excite an inflammatory process in the middle ear, the transmission of septic germs taking place through the Eustachian tube ; similar results may also occur from pyogenic bacteria being carried from the mouth to the throat, lungs, parotid gland, antrum, and even to the brain, as stated by Bergtold. When it is considered that of all diseases of a parasitic nature to which mankind is susceptible, dental caries is by far the most frequent, the possibilities just mentioned, can not be charged as being the improabble and unlikely speculation set forth by one who is "cranky" on the subject. Upon reviewing the various literature on this question, especially those portions of it which refer to the dangers of infection between the dentist and his patient, the speaker was much surprised to find no advice offered to the dental profession by competent bacteriologists, as tc the considerable (and oft-times *great*) danger present, to the patient, by pathological conditions the dentist *himself* may be suffering from at the time of operating, and to point out the necessity of establishing, by legislative measures if required, laws, or statutes, which would prevent the occurrence of such dangers. Reference was made more particularly to the jeopardy in which human life is placed, when people are subjected to treatment by a practising, *tubercular* dentist.

This may seem, to many, a bit of superfluous advice, *but the author had seen a tubercular member of the profession practising daily on unsuspecting, or ignorant, patients.*

The *greatest* danger, under such circumstances, *is not*, as some of you might imagine, in the infection of the patient by the transmission of the germs through the medium of the breath of the operator, but in the reception of the tubercular material, which becomes dry on the handkerchief, clothing, linen, or instruments of the dentist. The prevention of such dessication is so extremely difficult and impracticable as to be discarded without serious consideration, if such (prevention) be presented as a possible prophylactic measure, to enable the victim of this malady to continue his professional work until physically unable to do so on account of the inroads of the disease. It is not generally known that bacteria do not float in the atmosphere in the moist state, but only do so after desiccation, and then probably to no great extent, unless aided by more or less strong currents of air. Tuberculosis is now almost universally considered to be an infectious disease, and of so contagious a nature that we shall, many of us, see the day when attention to preventive measures against possible infection from cases of this disease is as regularly insisted upon as are the sanitary requirements in cases of small-pox, yellow fever and typhus fever(with the exception of somewhat less vigorous quarantining) at the present day. The period in which to accomplish this much desired treatment of tubercular cases will depend upon the rapidity with which the laity, and *professional men* even, become educated to the full comprehensions of the single and *sole* cause of the affection, the tubercle bacillus, and the proper realization of the benefits to be derived from the adoption of such measures. And to the intelligent efforts and advice of the members of the medical profession, as well as to the great aid which members of the dental profession can give by embracing each and every opportunity to inform patients, especially influential citizens, as to the true character of tuberculosis, must the accomplishment of this end very largely devolve.

Of all the various ways by which tubercle bacilli find entrance into the human body (such as from the surface of the skin through wounds, by contusions, cuts, or otherwise ; from the ingestion of milk and flesh from tubercular cows and animals, etc.,) infection by inspiration—by the entrance of the dried germs through the mouth, and so on to the lungs—far surpasses in frequency all other methods of transmission. And this can only be accomplished when the medium on which the micro-organisms have been discharged from the body dries, or disintegrates into powder or dust. For this reason the most dangerous source of infection is from handkerchiefs, or cloths on which the sputum has been received (unfortunately a too common procedure) and on which it becomes dry in an exceedingly short time. Consequently by merely preventing the sputum of phthisical persons from drying the most important kind of infectious matter may be rendered harmless.

The Dental Register.

ARTICULATE SOUND AND THE SOFT PALATE.

By A. C. Sloan, D.D.S.

It is a well-known fact that if from any cause the contact of the soft palate against the wall of the pharynx is impaired, either from disease or accident, or a congenital deformity—the air being allowed to escape through the nose—we get a nasal twang, most unpleasant to the ear and a source of great annoyance to the one afflicted. Yet it has been observed in individual cases that contact may be broken somewhat without being prejudical to the formation of articulate sounds.

It is essential that we, as dentists, should know to what extent contact of these parts may be broken without affecting speech.

The experiments of Passavant will give us the information we desire. He demonstrated the fact that the soft palate could be moved a certain distance from the posterior wall of pharynx without interfering with articulation, but when once this limit was passed a nasal intonation became apparent. He proved this by passing a thread—by means of a small tube—behind the soft palate in such a manner that one end protruded from the nose, the other from the mouth. Both ends of the thread were pulled, drawing the soft palate forward. At first no change was observed, but at a certain point the nasal twang became perceptible. He afterwards, to gain more accurate information about this distance, experimented with rubber tubing. Pieces of tubing 1.95 of an inch in length were placed behind the soft palate in such a manner that when the palate was raised the tubes would be pressed against the posterior wall of the pharynx, For the better adjustment of the tubes a thread was attached to either end, one protruding from the nostrils the other from the mouth. The experiment was made with three sizes of tubing ; the smallest having a sectional area of .0048 of an inch, the largest an area of .045 of an inch. The two smaller tubes made no difference in speech, but when the larger was used the nasal twang at once became noticeable. Thus it is proved that perfect enunciation of articulate sounds may be seriously affected by an opening between the soft palate and bulging wall of the pharynx, of no greater extent than one having an area of only .045 of an inch.

From the foregoing we can readily understand why the operation of staphyloraphy has almost always failed to give perfect speech. Bringing the two sides of the cleft together shortens the length of the soft palate, and leaves an opening greater than that which we have found from experiments will produce imperfect speech.

And will not these facts explain the reason for the mortification and chagrin we have felt at not perceiving so marked an improvement in the articulation as we so confidently expected when we supplied an obturator for a case of cleft palate.

It shows how accurately, how perfect must be the appliance that will make this closure and fulfil all the requirements as performed by the soft palate, and we should ever bear in mind the fact that if we leave an opening with an area of only .045 of an inch we shall have faulty articulation and a nasal twang.

Western Dental Journal.

Dental News.

THE Course of Lectures on Operative Dental Surgery at the National Dental Hospital which are intended for advanced Students and Young Practitioners and may be taken as a Post Graduate Course, will begin on Monday, Oct. 16th, at 6-30 p.m., with an open introductory lecture on the Morphology of the Human Denture as affecting Methods of Treatment, illustrated by models. Special subjects to be discussed by Mr. Geo. Cunningham in this year's lectures will include, (1.) Combinations of filling materials, (2.) Pulp capping and its results, tested by statistics, (3.) Crown, Bar, and Bridge work, with illustrative cases.

For further particulars see N.D.H. calendar. The fee for the Course is £2 : 12 : 6.

OPENING OF THE MEDICAL SCHOOLS.—So far as at present announced, Mr. S. J. Hutchinson will be the only representative of Dental Surgery taking part in the Introductory Addresses at the opening of the various Schools on Oct. 3rd. He will deliver an address at University College at 4 p.m.

APPOINTMENTS.

J. Coysh, L.D.S., Eng., has been appointed Dental Surgeon to the Liverpool Dental Hospital.

W. H. Gilmour, L.D.S. Eng., has been appointed House Surgeon to the Liverpool Dental Hospital.

BRITISH JOURNAL OF DENTAL SCIENCE.

DENTAL STUDENTS' SUPPLEMENT. SEPTEMBER 15TH, 1892.

I.—THE LICENSING CORPORATIONS.

Comparative Summary of Regulations for the License in Dental Surgery.

	Royal College of Surgeons, England	Royal College of Surgeons, Edinburgh.	Faculty of Physicians and Surgeons, Glasgow.	Royal College of Surgeons, Ireland.
1—PRELIMINARY EXAMINATION....................	Compulsory on all who commenced their Professional Education after July 22nd, 1878. Must be registered as a Dental Student at the office of the General Medical Council, 299, Oxford St., London, W.	Compulsory on all who commenced their Professional Education after July 22, 1878.	Compulsory on all who commenced the Professional Education after August 1st, 1878.	Compulsory on all, except those who have passed one equivalent examination.
2—Age at which the Candidate may present himself	Twenty-one.	Twenty-one.	Twenty-one.	Any age, but diploma cannot be granted until he is twenty-one.
3—DURATION OF PROFESSIONAL EDUCATION......	Four years subsequent to registration.	Four years.	Four years.	Four years.
4—COURSES OF LECTURES, &c., to be attended at a recognized School:—				
Anatomy	One course.	One Winter course.	One course of 6 months.	One course.
Physiology	One course.	One Course of 6 months.	One course of 6 months.	One course.
Surgery	Ditto.	One Winter course.	One course of 6 months.	One course of 6 months.
Medicine	Ditto.	Ditto.	One course of 6 months.	Ditto.

	Royal College of Surgeons, England.	Royal College of Surgeons, Edinburgh.	Faculty of Physicians and Surgeons, Glasgow.	Royal College of Surgeons, Ireland.
Chemistry	Instruction.	One Winter course.	One course.	One six months' course.
Materia Medica	Instruction.	One three months' course.	Ditto.	One three months' course.
Dissections and Demonstrations	Twelve months.	Twelve months.	Twelve months.	Nine months.
Practical Chemistry and Metallurgy	Instruction.	One three months' course.	One course.	Three months.
Practice of Surgery, and Clinical Lectures in Hospital....................	Two Winter Sessions.	One six months' course.	One course of 6 months.	Six months of each.
Dental Anatomy and Physiology	Two courses.	One course.	24 Lectures (Six months.)	TwelveLectures or Demonstrations.
Dental Surgery and Pathology		Ditto.	20 Lectures.	Twelve Lectures.
Metallurgy	One course.		12 Lectures.	Twelve Lectures.
Dental Mechanics	Two courses.	One course.	onstrations.	Twelve Lectures.
Practical Instruction in Mechanical Dentistry...	Three years under a competent Practitioner, all of which may be previous to Registration.	Three years under a registered Dental Practitioner	Three years under a Registered Dental Licentiate.	Three Years under a Registered Practitioner.
Practice of Dental Surgery in a recognized Dental Hospital,or in theDental Department of a recognized General Hospital	Two years.	Two years.	Two years.	Two years.
5—Fee	£10 10s. over the above stamp duty.	£10 10s.	£10 10s.	£10 10s.
6—Least period during which unsuccessful Candidates are referred to their studies	Six months, subject to the decision of the Board.	Three months.	Six months.	Six months.

7—PARTICULARS OF EXAMINATION	(A) *Written.* On General Anatomy and Physiology, General Pathology and Surgery, Dental Anatomy and Physiology, and Dental Pathology and Surgery. (B) *Practical.* (1) On the treatment of Dental Caries, and may be required to prepare and fill cavities with Gold or Plastic filling or material, or to do any other operation in Dental Surgery. (Candidates must provide their own instruments). (2) On the Mechanical and Surgical treatment of the various irregularities of children's teeth. (3) On Mechanical Dentistry. (C) *Oral.* Comprises the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, &c.	*Written and Oral:* First Part—Anatomy, Chemistry, Physiology. Second Part—Surgery, Medicine, Therapeutics, and special subjects, of Dental Anatomy and Physiology, Dental Surgery, Pathology, and Dental Mechanics. Registered Medical Practitioners are examined on the specialsubjects only. Practical Clinical Exam. given inDental Surgery, Pathology & Mechanics.	*Written, Oral & Practical:* 1st part—Anatomy, Physiology, Chemistry, and Metallurgy. Second Part—Surgery, Medicine, Materia Medica, and special Dental subjects. Practical Examination at a Dental Hospital. Candidates are to bring Excavator, Files, and Plugging Instruments.	*Written and Oral:* On all the subjects of the Curriculum. Preparations, Microscopes, and other appliances.
8—DATES OF EXAMINATIONS	May and November.	First examination.— Tuesday, May 2, 1893, " July 25, 1893. Second exam. on Thursday following.	1892, October 5—7. 1893, May 3—5.	Quarterly. Candidates must be registeredDentalPractitioners in practice before 1878.
For further information apply to Secretary.	MR. F. G. HALLETT, Examinatian Hall, Victoria Embankment, London, W.	JAS. ROBERTSON, Solicitor, Clerk of College, 1, George Square, Edin.	ALEX. DUNCAN, Esq., Faculty of Physicians and Surgeons, Glasgow.	G. F. BLAKE, Esq., Royal College of Surgeons, Dublin.

I. PRELIMINARY EXAMINATION.

REGULATIONS OF GENERAL MEDICAL COUNCIL.

No person shall be allowed to be registered as a Medical or Dental Student unless he shall have previously passed (at one or more examinations) a preliminary Examination in the subjects of General Education as specified in the following List:—

⁂ Regulations in operation from January 1st, 1892.

1. English Language, including Grammar and Composition.
2. Latin, including Grammar, Translation from specified authors, translation of easy passages not taken from such authors.
3. Mathematics, comprising (*a*) Arithmetic; (*b*) Algebra, as far as simple Equations; (*c*) Geometry, the subject matter of Euclid, Books I, II, III; with easy deductions.
4. One of the following Optional Subjects;—
   (*a*) Greek; (*b*) French; (*c*) German; (*d*) Italian; (*e*) any other modern language; (*f*) Logic.

List of Examining Bodies whose Examinations fulfil the conditions of the Medical Council as regards Preliminary Education, and entitle to registration as Medical or Dental Student.

1. UNIVERSITIES IN THE UNITED KINGDOM.

UNIVERSITY OF OXFORD:—

1. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects, Greek, French, German.
2. Senior Local Examinations; Certificate to include Latin and Mathematics.
3. Responsions.
4. Moderations.
5. Examinations for a Degree in Arts.

UNIVERSITY OF CAMBRIDGE:—

6. Junior Local Examinations: Certificates to include Latin and Mathematics, and also one of the following optional subjects:—Greek, French, German.
7. Senior Local Examinations; Certificate to include Latin and Mathematics.
8. Higher Local Examinations.
9. Previous Examination.
10. Examination for a Degree in Arts.

⁂ The Council will not in future accept any Certificate of pass in Preliminary Examination in General Education, unless the whole of the subjects included in the Preliminary Examination required by the Council for Registration of Students of Medicine have been passed at the same time; but this rule shall not apply to those who, previous to January 1, 1892, have passed a part of any Preliminary Examination recognized by the Council.

Provided that a University Examination required for graduation in Arts, wherein the specified subjects of General Education are included, may be recognized for the purpose of registration.

UNIVERSITY OF DURHAM:—

11. Examination for Certificate of Proficiency.
12. Examination for Students at the end of their first year.
13. Examination for a Degree in Arts.

UNIVERSITY OF LONDON:—

14. Matriculation Examination.
15. Preliminary Scientific (M.B.) Examination.
16. Examination for a Degree in Arts or Science.

VICTORIA UNIVERSITY:—

17. Preliminary Examination; Latin to be one of the subjects.
18. Entrance Examination in Arts, to include all the subjects required.

UNIVERSITY OF EDINBURGH:—

19. Local Examinations (Junior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
20. Local Examination (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
21. Preliminary Examination for graduation in Science or Medicine and Surgery.
22. Examination for a Degree in Arts.

UNIVERSITY OF ABERDEEN:—

23. Local Examinations (Junior Certificate); Certificate to include all the subjects required.
24. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
25. Preliminary Examination for graduation in Medicine or Surgery.
26. Examination for a Degree in Arts.

UNIVERSITY OF GLASGOW:

27. Local Examinations (Junior Certificate); Certificate to include all the subjects required.
28. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following subjects:—Greek, French, German.
29. Preliminary Examination for graduation in Medicine or Surgery.
30. Examination for a Degree in Arts.

UNIVERSITY OF ST. ANDREWS:—

31. Local Examination (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—Greek, French, German.
32. Local Examinations (Junior Certificate); to include all the subjects required.
33. Preliminary Examination for graduation in Medicine or Surgery
34. Examination for a Degree in Arts.

UNIVERSITY OF DUBLIN.

35. Public Entrance Examination.
36. General Examination at end of Senior Freshman year.
37. Examination for a Degree in Arts.

ROYAL UNIVERSITY OF IRELAND :—

38. Matriculation Examination.

OXFORD AND CAMBRIDGE SCHOOLS' EXAMINATION BOARD :—

39. Certificate, to include the following subjects, an adequate knowledge of English Grammar and Orthography, as shown in the course of the Examination, to the satisfaction of the Examiners, being held as conforming to the requirements of the Medical Council in regard to those subjects:

(*a*) Arithmetic, including Vulgar and Decimal Fractions;
(*b*) Algebra, including Simple Equations;
(*c*) Geometry, including the first two books of Euclid;
(*d*) Latin, including Translation and Grammar;
(*e*) Also one of these optional subjects, (Greek, French, German.)

II.—OTHER BODIES NAMED IN SCHEDULE (A) TO THE "MEDICAL ACT."

APOTHECARIES' SOCIETY OF LONDON :—

40. Examination of Arts.

*ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH :—

41. Preliminary (combined) Examination in General Education.

*FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW :—

42. Preliminary Examination in General Education.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—

43. Preliminary Examination; Certificates to include Mathematics.

III.—EXAMINING BODIES IN THE UNITED KINGDOM NOT INCLUDED IN SCHEDULE (A) TO THE "MEDICAL ACT" (1858).

COLLEGE OF PRECEPTORS :—

44. Examination for a First Class Certificate, or Second Class Certificate of First or Second Division, Algebra, Geometry, Latin, and either a Modern Language, or Greek, or Chemistry, or Botany, or Zoology, having been taken.
45. Preliminary Examination for Medical Students.

INTERMEDIATE EDUCATION BOARD OF IRELAND :—

46. Junior Grade Examination
47. Middle Grade Examination
48. Senior Grade Examination

} Certificate in each case to include all the subjects required.

EDUCATIONAL INSTITUTE OF SCOTLAND :—

49. Preliminary Medical Examination.

SCOTCH EDUCATIONAL DEPARTMENT :—

50. Leaving Certificates in each Grade and in Honours.

* The Examination of the Bodies to which an asterisk is prefixed, will not be accepted for purposes of Students' registration on and after January 1, 1892, except in cases in which a part of the Examination has been passed previous to that date.

IV.—CERTAIN EXAMINATIONS OF INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

REGISTRATION OF DENTAL STUDENTS.

Every Dental Student shall be registered in the manner hereinafter prescribed by the General Medical Council.

No Dental Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council, and has produced evidence that he has commenced Dental Study.

The commencement of the course of Professional Study recognised by any of the Qualifying Bodies shall not be reckoned as dating earlier than fifteen days before the date of Registration.

Every person desirous of being registered as a Student shall apply to the Branch Registrar of the division of the United Kingdom in which he is residing, according to the prescribed form, which may be had on application to the several Qualifying Bodies, Medical Schools, and Hospitals; and shall produce or forward to the Branch Registrar a Certificate of his having passed a Preliminary Examination, as required by the General Medical Council, and evidence that he has commenced Medical Study.

Students who commenced their professional education by apprenticeship to Dentists entitled to be registered, or by attendance upon professional lectures before July 22nd, 1878, (when Dental Education became compulsory,) shall not be required to produce evidence of having passed a Preliminary Examination.

Candidates for a Diploma in Dental Surgery shall produce certificates of having been engaged during four years in Professional Studies, and of having received three years' instruction in Mechanical Dentistry from a registered Practitioner.

One year's *bona-fide* apprenticeship with a registered Dental Practitioner, after being registered as a Dental Student, may be counted as one of the four years of professional Study.

The three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student; but no year of such mechanical instruction shall be counted as one of the four years of Professional Study unless taken after registration.

III.—EDUCATIONAL BODIES.

LONDON.

DENTAL HOSPITAL OF LONDON, AND LONDON SCHOOL OF DENTAL SURGERY, LEICESTER SQUARE.

HOSPITAL STAFF.

Consulting Physician—Sir Richard Quain, Bart., M.D., F.R.C.P., LL.D.
Consulting Surgeon—Christopher Heath, F.R.C.S.

Consulting Dental Surgeons.

Sir John Tomes, F.R.S., F.R.C.S., L.D.S., T. Arnold Rogers, M.R.C.S., L.D.S.

Dental Surgeons.

9 a.m.—Monday ... C. E. Truman, M.A., M.R.C.S., L.D.S.
,, Tuesday ... R. H. Woodhouse, M.R.C.S., L.D.S.
,, Wednesday George Gregson, M.R.C.S., L.D.S.
,, Thursday... Storer Bennett, L.R.C.P., F.R.C.S., L.D.S.
,, Friday ... W. Hern, M.R.C.S., L.D.S.
,, Saturday... L. Matheson, L.D.S.

Assistant Dental Surgeons.

,, Monday ... J. F. Colyer, M.R.C.S., L.R.C.P., L.D.S.
,, Tuesday ... W. B. Paterson, F.R.C.S., L.D.S.
,, Wednesday E. Lloyd Williams, L.R.C.P., M.R.C.S., L.D.S.
,, Thursday... C. F. Rilot, M.R.C.S., L.D.S.
,, Friday ... H. Baldwin, M.R.C.S., L.D.S.
,, Saturday... H. Lloyd Williams, M.R.C.S., L.D.S.

AFTERNOON STAFF.

1.30 p.m.—Monday ... A. C. Woodhouse, L.D.S.
,, Tuesday ... W. H. Dolamore, M.R.C.S., L.R.C.P., L.D.S.
,, Wednesday F. J. Bennett, L.D.S.
,, Thursday... W. H. Woodruff, L.D.S.
,, Friday ... Cornelius Robbins, L.D.S.

Administrators of Anæsthetics.

9.30 a.m.—
,, Tuesday ... Frederic Hewitt, M.D.
,, Wednesday Henry Davis, M.R.C.S., L.S.A.
,, Thursday... F. Woodhouse Braine, F.R.C.S.
,, Friday ... Dudley W. Buxton, M.D., B.S., M.R.C.P.
,, Saturday G. H. Bailey, M.R.C.S.
2.0 p.m. Daily George Rowell, F.R.C.S.

Demonstrators.

E. Briault, L.D.S.
A. Colyer, M.R.C.S., L.R.C.P., L.D.S.
E. Gardner, L.D.S.
George Hern, M.R.C.S., L.R.C.P., L.D.S.

Medical Tutor.—W. H. Dolamore, M.R.C.S., L.R.C.P., L.D.S.

5 *House Surgeons and* 3 *Assistant House Surgeons attend daily.*

Demonstrations.—The Medical Officers will give Demonstrations on cases selected from time to time, every morning during the Lecture Season; and at the end of the Course those Gentlemen who have attended the Demonstrations to the satisfaction of the Medical officers will be permitted to perform operations at the Hospital under the supervision of the Medical Officers and the House Surgeon.

Dresserships for cases of Extraction.—The appointments are held for two months, and consist of six senior Dresserships for extractions under anæsthetics and eighteen Junior Dresserships for ordinary extractions.

The Senior Dressers will be selected from those pupils only who have entered fully both to the practice and lectures of this Hospital, and also to the Course required by the College of Surgeons for the Licence in Dental Surgery at one of the General Hospitals.

The Hospital is lighted throughout by electricity. The New Mechanical Laboratory is now open. The Laboratory is carefully fitted with all the requirements of a modern Dental Laboratory, and is lighted with Electric Light for foggy weather. Each bench is also well lighted by first-rate daylight. The workroom is under the superintendence of A. J. WATTS, L D.S.I., who will attend daily from 9 a.m. to 6 p.m. to give practical instructions to students.

The WINTER SESSION will commence on October 3rd, 1892.

The SUMMER SESSION will commence in May, 1893.

LECTURES.

Denta Surgery and Pathology.—Mr. STORER BENNETT.

Dental Anatomy and Physiology (*Human and Comparative*), by ARTHUR UNDERWOOD.

MEDICAL TUTOR.

The Medical Tutor attends four days in the week, from 5 to 7 p.m., for two months previous to two of the Annual Examinations. His classes are open to all Students, and are intended to assist those who are preparing for their examinations at the College of Surgeons; generally speaking, to guide and drect the studies of the pupils, and prepare them in the subjects for the Examinations.

FEES.

GENERAL FEES FOR THE SPECIAL LECTURES REQUIRED BY THE CURRICULUM.

Viz., two Courses on Dental Anatomy, two Courses on Dental Surgery, two Courses on Mechanical Dentistry, and one Course of Metallurgy, £15 15s.

Fee for the Two Years' Practice of the Hospital required by the Curriculum, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £31 10s.

Students who perform Operations for filling Teeth must provide their own Instruments for the same.

Additional Fees for a General Hospital for the two years, to fulfil the requirements of the Curriculum, vary from £50 to £60.

PRIZES.

The Prize-day will in future be held in July.

1. Prizes are awarded by the Lecturers for the best examinations in the subjects in their respective courses, at the end of the Summer and Winter Sessions.

2. Arrangements have been made for a Prize in Operative Dentistry, in the competition for which each candidate is entrusted with the care of a mouth, which he shall, if not impracticable, set thoroughly in order.

3. A prize of the value of five guineas is also given by Messrs. Ash & Sons for the best essay on a surgical subject connected with the mouth.

4. A scholarship of the value of £20 has been founded by Sir Edwin Saunders, and will be awarded at the close of each Summer Session.

Note.—The Medical Committee have resolved "that the holder of the Saunders Scholarship be admitted without additional fee to the extra year of Hospital Practice."

The Dean requests that all communications relating to the Medical School may be addressed to him at the Hospital, where he will attend in the afternoons, from Sept. 26th to Oct. 31st inclusive, from 5 till 6 o'clock, or on Wednesday mornings from 10.30 till 12.

MORTON SMALE, M.R.C.S., L.D.S., L.S.A., *Dean.*

NATIONAL DENTAL HOSPITAL AND COLLEGE, GREAT PORTLAND STREET, W.

FOUNDED 1861.

HOSPITAL STAFF.

Consulting Physicians.

B. W. RICHARDSON, M.A., M.D., F.R.S.
W. H. BROADBENT, M.D., F.R.C.P.

Consulting Surgeons.

SIR SPENCER WELLS, BART., F.R C.S. CHRISTOPHER HEATH, F.R.C.S.

Consulting Dental Surgeon.

SIR EDWIN SAUNDERS, F.R.C.S.

Hon. Visiting Surgeon.

E. W. ROUGHTON, F.R.C.S., &c.

Deatal Surgeons.

Monday ...	F. HENRI WEISS, L.D.S., Eng.
Tuesday ...	ALFRED SMITH, L D.S., Eng.
Wednesday ...	MARCUS DAVIS, L.D.S., Eng.
Thursday ...	A. F. CANTON, L.D.S., Eng.
Friday ...	H. G. READ, M.R.C.S., L.R.C.P., L.D.S., L.S.A., D.M.D., Harvard.
Saturday ...	W. R. HUMBY, L.D.S., Eng.

Assistant Dental Surgeons.

Monday ...	WILLOUGHBY WEISS, L.D.S., Eng.
Tuesday ...	PERCY WHITE, M.B.B.S., M.R.C.S., L.D.S., Eng.
Wednesday ...	SIDNEY SPOKES, M.R.C.S., L.D.S., Eng.
Thursday ...	T. G. READ, L.D.S., Eng. D.M D.
Friday ...	C. W. GLASSINGTON, M.R.C.S., L.D.S., Edin.
Saturday ...	W. RUSHTON, L.D.S., Eng.

House Surgeon.—ARNOLD PRAGER, L.D.S., Eng.

Anæsthetists.

PERCY EDGELOW, M.R.C.S., L.R.C.P.
JAMES MAUGHAN, M.D., L R.C.P., M.R.C.S.
S. E. PEDLEY, M.R.C S., L.R.C.P., L D.S., Eng.
EVERETT NORTON, M.R.C.S., L.S.A.
A. E. BRIDGER, M.D.
ARCHIBALD L. BRIGHT, M.R.C.S., L.R.C.P.

LECTURES.

Dental Auatomy nnd Physiology	SIDNEY SPOKES, M R.C.S., L.D.S., Eng.
Dental Surgery and Pathology	WILLOUGHBY WEISS, L.D.S., Eng.
Dental Mechanics	HARRY ROSE, L.D.S., Eng.
Dental Metallurgy	W. LAPRAIK, Ph.D , F.I.C., F.C.S.
Operative Dental Surgery ...	GEORGE CUNNINGHAM, M.A., D.M.D., L.D.S., Eng.
Dental Materia Medica	C. W. GLASSINGTON, M.R.C.S., L.D.S., Ed.
Elements of Histology	JAMES MAUGHAN, M.D., L.R.C.P., M.R.C.S.
Demonstrator of Dental Mechanics	W. R. HUMBY, L.D.S , Eng.

The hospital is open for the reception of patients every week-day, from 9 o'clock till 11 o'clock a.m. The House Surgeon attends daily, from 9 a.m. till 2 o'clock p.m.

Dresserships in the Extraction Room.

These appointments are held for two months by six senior and twelve junior students of the Hospital. The respective dressers for each day are required to be in attendance from 9 o'clock till the conclusion of the practice; and they will be under the direction of the Dental Surgeons of the day, and of the House Surgeon.

The stopping rooms have accomodation for 20 chairs.

Clinical Lectures and Demonstrations.

Each medical officer will give clinical lectures, when opportune, during the ensuing year. Clinical lectures will also be given from time to time on cases of special interest; and also demonstrations upon the preparing and filling of cavities and other operations upon the teeth and contiguous parts.

The Hon. visiting Physician and Surgeon give Demonstrations weekly, on cases of Oral Surgery, Anæsthetics, Cardiac, and Pulmonary lesions.

Attendance and Examination of Students.

A register is kept of the attendance of students at the Hospital practice and lectures. An attendance of full two years at Hospital practice is required by the College of Surgeons of England; and no schedule will be signed for any lectures of which less than two-thirds have been attended. Class examinations are held frequently during the several courses, to test the progress and attention of the pupils; and at the end of each course of lectures a written examination is held. An insufficient attendance at lectures disqualifies the student for receiving any prize of that year.

Tutorial classes are held to prepare for the final examinations, students who have, at this school, complied with the Dental portion of the Curriculum.

LECTURES.

Winter Session, commencing on Thursday, Oct. 1st, 1892.

Dental Anatomy and Physiology, by Sidney Spokes, M.R.C.S., L.D.S., Eng. On Tuesdays and Thursdays, at 6 p.m., during October, November, and December.

Operative Dental Surgery, by George Cunningham, M.A., D.M.D., L.D.S., Eng. On Mondays, at 6.30 p.m., during October, November and December, (Free to Students of the Hospital and College.)

Dental Materia Medica and Therapeutics, by Charles W. Glassington, M.R.C.S., L.D.S., Edin. On Tuesdays, at 7.30 p.m. during October, November and December. (Free to students of the College.)

Dental Metallurgy, by W. Lapraik, F.I.C., F.C.S. On Tuesdays at 7.30 p.m., during January, February, and March.

Dental Mechanics, by Harry Rose, L.D.S. Eng. On Mondays at 7 p.m., during January, February, and March.

Demonstrations on Dental Mechanics, by W. Robinson Humby, L.D.S., Eng. On Wednesdays, at 7 p.m., during January, February, and March. (Free to students of the College.)

Summer Session, 1893.

Dental Surgery aud Pathology, by Willoughby Weiss, L.D.S., Eng. On Mondays and Thursdays, at 6 p.m., during May, June, and July.

Elements of Histology, by James Maughan, M.D., L.R.C.P., M.R.C.S. On Mondays and Thursdays, at 5 p.m., during May, June, and July. (Free to students of the college.)

FEES.

GENERAL FEE FOR SPECIAL LECTURES REQUIRED BY THE CURRICULUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND: £12 12s.

Fees to single Courses.	One Course.	Two Courses.
Dental Anatomy and Physiology	£2 12 6	£4 4 0
Dental Surgery and Pathology	2 12 6	4 4 0
Dental Mechanics	2 12 6	4 4 0
Dental Metallurgy	3 3 0	5 5 0
*Operative Dental Surgery	2 12 6	
*Dental Materia Medica	2 2 0	
*Elements of Histology	1 1 0	
*Demonstrations on Dental Mechanics	1 1 0	

Hospital Practice to Registered Practitioners (six months), £7 7s. Ditto (twelve months), £9 9s.

Fee for the two years' Hospital Practice required by the Curriculum, £12 12s. Perpetual Fee, £15 15s.

Total Fee for the Special Lectures and Hospital Practice required by the Curriculum, £25 4s. Perpetual Fee, £31 10s.

PRIZES.

An Entrance Exhibition of the value of £15 will be awarded at the commencement of each Summer and Winter Session, after an Examination in the following Subjects:—

Elementary Physics (Statics, Dynamics and Electricity). Examiner—W. H. COFFIN, Memb. Phys. Doc. and Inst. Elect. Engineers.

Physiology. (The Functions of Respiration, Circulation and Digestion.) Examiner—JAMES MAUGHAN, M.D.

Osteology. (Bones of the head.) Examiner—E. W. ROUGHTON, F.R.C.S.

Chemistry. Examiner—WM. LAPRAIK, Ph D., F.I.C., F.C.S.

Dental Mechanics. (Theoretical and Practical). Examiners—HARRY ROSE, L.D.S., Eng., W. R. HUMBY, L.D.S., Eng.

Six Prizes in Medals, are open for competition among the students of the Colleges, at the end of each Course of Lectures, on the following subjects, viz.. Dental Anatomy, Dental Surgery, Dental Mechanics, Metallurgy, Operative Dental Surgery, and Dental Materia Medica.

Certificates of Honour will be awarded to those Students who show superior proficiency in any of the classes.

The Rymer Gold Medal for General Proficiency, value £5, will be awarded annually to the most distinguished Student of the year. His general conduct and attendance must have been in every respect satisfactory. At the time of the special examination for the Rymer Medal, the Student must not hold any qualification. The Medal will be awarded on the understanding that the Student completes the Dental Curriculum.

The Ash Prize, value £3 3s. in cash for the best Thesis on a subject in Dental Surgery.

The public Distribution of Prizes will take place during the Winter Session.

HARRY ROSE, *Dean.*

EDINBURGH.

INCORPORATED EDINBURGH DENTAL HOSPITAL AND SCHOOLS.

Consulting Physician—Alex. Peddie, M.D., F.R.C.P.E.
Consulting Surgeon—Joseph Bell, M.D., F.R.C.S.E.
Consulting Dental Surgeon—John Smith, M.D., F.R.C.S.E.
Dean—W. Bowman Macleod, L.D.S.

Dental Surgeons.

Andrew Wilson, L.D.S., Edin.
Malcolm Macgregor, L.D.S., Edin.
George Watson, L.D.S., Edin.
J. Stewart Durward, L.D.S., Ed.
James Mackintosh.
William Forrester.

Assistant Dental Surgeons.

John S. Amoore, L.D.S., Eng.
J. Graham Munro, L.D.S., Edin.
Fred Page, L.D.S.
John Turner, L.D.S., Edin.
David Munroe, L.D.S., Edin.
Thomas Gregory, L.D.S.

Extra Assistant Dental Surgeons.

R. Nasmyth Hannah, L.D.S.
Sewill Simmons, L.D.S.

Chloroformists.

W. Lundie, M.B.C.M.
Matheson Cullen, M.B., C.M.
J. M. Farquharson, M.B., C.M.

Tutorial Dental Surgeon.

Frederick Turnbull, L.D.S.

DENTAL SCHOOL.

Lectures.

Dental Anatomy and Physiology (Human and Comparative) by Andrew Wilson, L.D.S., (Edin.)—These Lectures will be delivered on the evenings of Tuesday and Friday, at 8 o'clock, commencing November, 1892. The course consisting of twenty-four Lectures, will be illustrated by preparations, models, diagrams, microscopical specimens, etc.

Dental Surgery and Pathology, by George W. Watson, L.D.S. (Edin.)—These Lectures will be delivered on the mornings of Tuesday and Friday at 8 o'clock, during the Summer Session, commencing May, 1893. The course, consisting of twenty-two Lectures, will be illustrated by preparations, models, diagrams, microscopical preparations, etc.

Mechanical Dentistry, by W. Bowman Macleod, L.D.S., (Edin.) The Lectures will commence November, 1892, at 8 p.m., and be continued every Wednesday thereafter till the Course of at least twelve Lectures is concluded.

Practical Mechanics.—Assistant Demonstrators. J. Stewart Durward, L.D.S. (Edin), J. Graham Munroe, L.D.S. (Edin.)—In addition to the Systematic Lectures, there will be given during the Session, Demonstrations on Dental Mechanics, and each Student will be expected to prepare the mouth, take the impression, make the denture, and insert the same in at least four cases. Special facilities are afforded in the Mechanical Department; a large and fully equipped workroom under the charge and direction of a competent mechanic, having been set aside for the construction of dental appliances. The Demonstrations will be spread over the two years of Hospital practice, and will be given as occasion serves. Students will require to furnish their own hand tools.

In the various classes prizes will be offered for competition.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.—Hospital Practice, £15 15s. One Course each of Dental Anatomy, Dental Surgery, and Mechanical Dentistry, £9 15s—£25 10s.

Fees to separate Classes.—Dental Anatomy, Dental Surgery, Mechanical Dentistry, £3 5s. each.

The Hospital Practice and Lectures qualify for the Dental Diploma of the Royal College of Surgeons, Edinburgh, and also for the other Licensing Bodies. Second Courses of the Lectures as required by the Royal College of Surgeons of England, £2 4s.

For further information apply to the Dean, who will be found at the Hospital every Thursday morning between 9 and 10 o'clock.

THE SESSION 1892-3 OPENS OCTOBER 5th, 1892.

General Fee for the Hospital Practice and special Lectures required by the Curriculum.

Hospital Practice, Two Years........................	£15 15 0
One Course of 24 Lectures in Dental Anatomy ...	9 15 0
,, 22 ,, ,, Surgery ...	
,, 12 ,, ,, Mechanics ...	
Total.....	£25 10 0

For further particulars, apply to the Dean, 5, Lauriston Lane, Edinburgh.

GLASGOW.

DENTAL HOSPITAL AND SHCOOL.

4, CHATHAM PLACE, STIRLING ROAD.

The Hospital is open daily except Saturday and Sunday, from 5 p.m. till 7 p.m.

The work of the Hospital is conducted as far as possible, by the Students, under the supervision of the Dental Officer of the day. Cases of special interest will be made the subject of clinical instruction or demonstration as they occur.

The practice of the Hospital may be entered upon at any time during the Session and attendance dated therefrom. Fee for the two years practice required by the Curriculum, £15 15s. Fee for each course of Lectures, £3 3s.

DENTAL SCHOOL.

Dental Anatomy and Physiology, Human and Comparative, by W. WALLACE, M.A., M.B., L.D.S.

The Lectures will be delivered in the Summer Session, on the evenings of Tuesdays and Fridays, at 7 p.m., and will be illustrated by Diagrams, Preparations, and Microscopic Specimens. Text Book—Tomes, Manual of Dental Anatomy, Human and Comparative.

Dental Surgery and Pathology, by REES PRICE, L.D.S. Eng., M.R.C.S.

These Lectures are delivered on Tuesdays and Thursdays during the months of May and June, at 8 a.m., and will be illustrated by recent Specimens, and other Preparations and Drawings, &c. Text-books—Tomes, Manual of Dental Surgery; Salter's Dental Pathology and Surgery.

Mechanical Dentistry, by J. A. BIGGS, L.D.S.

This course will commence on the first Tuesday of November at 7 p.m., and will consist of 12 Lectures, with Practical Demonstrations in Dental Laboratory.

All communications on matters relating to the Dental School should be addressed to the Secretary, 117, Wellington Street, Glasgow, who will forward detailed Prospectus of the School.

BIRMINGHAM.

MASON COLLEGE, (WITH QUEEN'S FACULTY OF MEDICINE.)

Principal	Professor R. S. HEATH, M.A., D.Sc.
Dean	Professor WINDLE, M.A., M.D., D.Sc.

DENTAL DEPARTMENT.

Professors and Lecturers.

Anatomy—Professor BERTRAM C. A. WINDLE, M.A., M.D., D.Sc.
Physiology—Professor F. J. ALLEN, M.A., M.B.
Chemistry—Professor W. A. TILDEN, D.Sc., F.R.S.
Chemical Physics—Professor J. H. POYNTING, D.Sc., F.R.S.
Medicine { Professor C. W. SUCKLING, M.D., M.R.C.P.
(*Vacant*).
Surgery { Professor OLIVER PEMBERTON, F.R.C.S.
Professor BENNETT MAY, B.S., F.R.C.S.
Materia Medica—JOHN BARCLAY, B.Sc.
Dental Surgery—(*Vacant*).
Dental Anatomy—J. HUMPHREYS, L.D.S.I., F.L.S.
Dental Mechanics—W. T. ELLIOTT, L.D.S. Edin., & I., F.C.S.
Dental Metallurgy { W. A. TILDEN, D.Sc., F.R.S.
THOMAS TURNER, Assoc. R.S.M.
Surgical Diseases of the Mouth—F. MARSH, F.R.C.S.
Medical Diseases of the Mouth—STACEY WILSON, M.B., M.R.C.P.

Demonstrators.

Operative Dental Surgery—W. T. MADIN, L.D.S.
Mechanical Dentistry—F. H. GOFFE, L.D.S.
Dental Pathology—C. D. MARSON, M.R.C.S., L.R.C.P., L.D.S.

Special Courses.

Of Lectures for Dental Students will be delivered on—

i. Syphilis and Surgical Diseases of the Mouth in their relation to Dentistry, by Frank Marsh, F.R.C.S., Surgeon to the Queen's Hospital.

ii. Diseases of the Mouth and of Digestion in their relation to Dentistry, by T. Stacey Wilson, M.B., M.R.C.P., Physician to the General Hospital.

The Dental School is now transferred, with the Faculty of Medicine, to the Mason College, of which for the future it will form a Department. The Department, in conjunction with the Dental, the General, and the Queen's Hospitals, provides the entire course of instruction required for the Diplomas in Dental Surgery of the Royal College of Surgeons.

The College possesses a well equipped Dental Museum and Laboratory. An Entrance Scholarship, Medals, and Certificates in the classes are offered annually. There are special courses on Syphilis and Surgical Diseases of the Mouth, on Diseases of the Mouth and Stomach in relation to Dentistry. and on Practical Dental Microscopy. At the Dental Hospital, particular stress is laid upon the teaching of all latest methods of conservative Dentistry, including the various modes of Gold Filling, and Crown and Bridge work.

For prospectuses, and further information, application should be made to JOHN HUMPHREYS, Esq., L.D.S., F.L.S. Hon. Sec., to the Department, 22, Newhall Street, or to

GEO. H. MORLEY, REGISTRAR.

BIRMINGHAM DENTAL HOSPITAL,

71, Newhall Street.

Open Daily at Nine a.m.

Hon. Consulting Physician— Robert M. Simon, M.D.
Hon. Consulting Surgeon—John St. S. Wilders, M.R.C.S.

Hon. Consulting Dentists :
Thomas R. English.
Adams Parker, L.D.S.
Charles Sims, L.D.S.

Hon. Administratars of Anæsthetics.
S. Haynes, M.B., Ch. M.
Felix Vinrace, M.D., F.R.C.S.
E. G. Hutchinson, L.K.Q.C.I.

Hon. Dental Surgeons :
H. Breward Neale, L.D.S.
F. E. Huxley, M.R.C.S , L.D.S.
J. Humphreys, L.D.S.
F. W. Richards, L.D.S.
W. Palethorpe, L.D.S.

Hon. Assistant Dental Surgeons :
F. H. Goffe, L.D.S.
W. R. Roberts, L.D.S.
F. R. Howard, L.D.S.
A. E. Donagon, L.D.S., M.A.
W. T. Madin, L.D.S.
J. Mountford, L.D.S.

House Surgeon :
W. R. Owen, L.D.S.

DEMONSTRATIONS.

Clinical Demonstrations will be given from time to time by the staff on cases of particular interest ; also daily upon the preparing and filling of cavities, the insertion of porcelain inlays, pivoting teeth, adapting porcelain and metal crowns to broken down teeth.

Dresserships in the extraction room for all Students.

Dental Students are required to register their names for Hospital Practice with the Honorary Surgical Secretary, Mr. F. W. Richards, 27, Paradise Street, from whom further information may be obtained.

DENTAL HOSPITAL OF IRELAND.

25, LINCOLN PLACE, DUBLIN.

The Winter Session will commence on Monday, October 3rd, 1892.
The Summer Session will commence in May, 1893.

Consulting Physicians :
F. R. Cruise, M.D.
John W. Moore, M.D.

Consulting Surgeons :
E. H. Bennett, F.R.C.S.I.
Sir W. Stokes, F.R.C.S.I.

Consulting Dental Surgeons :
R. H. Moore, F.R.C.S.I.
Daniel Corbett, M.R.C.S.E., L.D.S., Eng.

Dental Surgeons :
Robert Hazelton, F.R.C.S.I.
W. Booth Pearsall, F.R.C.S.I.
R. Theodore Stack, M.D., F.R.C.S.I., D.M.D.(Harv.) L.D.S., Eng.
A. W. W. Baker, M.D., F.R.C.S.I., L.D.S.I.
Daniel Corbett, Jr., A B., F.R.C.S.I.
George Wycliffe Yeates, M.B., Ch. M., L.D.S.I.
G. M. P. Murray, F.R.C.S.I.

Assistant Dental Surgeons.

J S. Thomson, L.D.S., Ed.	Shenstone Bishop, L.D.S.I.

Anæsthetists.

J.G. Cronyn, L.R.C.S.I., K.L.Q.C.P.I.	John R. Graves, L.R.C.S.I., L.K.Q.C.P.I.

James B. Coleman, M.B., Ch. M., R.U.I.
Pathologist—William Mallet Purser, M.D.
Registrar—William A. Shea.

In connection with the Dental Hospital of Ireland, the Dental School will be open for the Winter Session on October 3rd, 1892.

All Dental Students who have passed their Preliminary Examination are admissible to the Clinical Instruction of the Hospital, after paying Fees and subscribing to the conditions prescribed by the Staff.

In addition to Clinical Instruction, Courses of Lectures and Demonstrations will be given at the Hospital in Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, crowns, pivots, porcelain inlays, gold filling, regulating plates, &c., by Robert Hazelton, F.R.C.S.I.; W. Booth Pearsall, F.R.C.S.I.; R. Theodore Stack, M.D.; A. W. W. Baker, M.D.; Daniel Corbett, F.R.C.S.I.; G. W. Yeates, M.B., and G. M. P. Murray, F.R.C.S.I; and at the School of Physic which is within a few yards of the Hospital. Special Lectures for Dental Students will be given in Dental Anatomy, and in Metallurgy by Professor Cunningham, and Professor Reynolds.

The Lectures on Dental Surgery and Mechanical Dentistry will be given during the winter, those in Dental Anatomy and Metallurgy during the summer months.

In addition to the longer courses of Hospital attendance, special courses of three months duration, will be given to Surgeons about to join the Army and Navy, or to practise in the Colonies or remote country districts.

Regulations as to Fees and other conditions can be obtained from the Registrar of the Hospital, or from

R. Theodore Stack, Dean.

THE OWENS COLLEGE, MANCHESTER.

DENTAL DEPARTMENT.

Anatomy—Professor Alfred H. Young, M.B., F.R.C.S.
Physiology—Brackenbury Professor Wm. Stirling, M.D., D.Sc.
Medicine—Professor Julius Dreschfeld, M.D., F.R.C.P.
Surgery—Professor A. W. Hare, M.B., F.R.C.S.E., F.R.S.E,
Clinical Surgery—Walter Whitehead, F.R.C.S.E.
Chemistry—Professor Harold B. Dixon, M.A., F.R.S.
Organic Chemistry—Professor W. H. Perkin, Ph D., F.R.S.
Materia Medica—Peofessor D. J. Leech, M.D., F.R.C.P.
Dental Surgery—G. G. Campion, L.D.S.
Operative Surgery—G. O. Whittaker, L.D.S.
Dental Anatomy—W. A. Hooten, L.D.S., L.R.C.P., M.R.C.P.
Dental Mechanics—Thomas Tanner, L.D.S.
Dental Metallurgy—C. A. Burghardt, Ph. D.
Operative Dentistry—G. O. Whittaker, L.D.S.

The Fee for 2 years' lectures, &c., required by the Dental Curriculum of the College of Surgeons is £50 payable in two sums of £25 each at the beginning of the first and second years of studentship.

The Fee for the two years' Dental Hospital Practice is £12 12 0.

The 2 years' general Hospital Practice is taken at the Royal Infirmary. The fee is £10 10 0, and includes that for attendance at the Lectures on Clinical Surgery.

For further particulars with regard to the Dental Department, application should be made to the Registrar, The Owens College, Manchester.

THE VICTORIA DENTAL HOSPITAL OF MANCHESTER, DEVONSHIRE STREET, ALL SAINTS.

Consulting Physicians :

HENRY SIMPSON, M.D., M.R.C.S. | D. J. LEECH, M.D., F.R.C.P.

Consulting Surgeons :

E. LUND, F.R.C.S. | T. JONES, F.R.C.S.
F. A. HEATH, M.R.C.S. | J. HARDIE, F.R.C.S.

Consulting Dental Surgeons.

H. CAMPION, M.R.C.S. | PARSONS SHAW, D.D.S.

Dental Surgeons.

Monday Morning	I. RENSHAW, L.D.S.I. ; D. HEADRIDGE, L.D.S. Eng.
Monday Evening	W. HEADRIDGE, L.D.S.I. ; H. DRESCHFELD, L.D.S.I.
Tuesday Morning	T. TANNER, L.D.S. Eng. ; G. O. WHITTAKER, L.D.S. Eng.
Wednesday Morning	P. A. LINNELL, L.D.S. Eng. ; F. W. MINSHALL, L.D.S.I.
Wednesday Evening	W. A. HOOTON, L.D.S. Eng.; C. R. MORLEY, L.D.S. Eng.
Thursday Morning	W. DOUGAN, L.D.S.I. ; E. P. COLLETT, L.D.S. Eng.
Friday Morning ...	G. G. CAMPION, L.D.S. Eng. ; W. SIMMS, L D.S.I.
Friday Evening	W. DYKES, L.D.S. Glas. ; C. H. SMALE, L.D.S., Eng.
Saturday Morning	J. W. DUNKERLEY, L.D.S.I. ; W. SMITHARD, L.D.S.I.

Administrators of Anæsthetics.

Wednesday Morning	J. PRINCE STALLARD, M.B.
Saturday Morning	ALEXANDER WILSON, F.R.C.S.

Demonstrator.

T. E. SHERRATT, L.D.S.E.

House Dental Surgeon.

F. D. TANNER, L.D.S., Eng.

The Hospital is situated conveniently for Students about 5 minntes' walk from The Owens College. It contains separate operating rooms devoted respectively to fillings, extractions, and operations under anæsthetics, and is open each morning in the week, and on Monday, Wednesday and Friday Evenings.

A Laboratory has recently been opened to afford Students every facility for acquiring manipulative skill in Crown work and Mechanical Dentistry.

Largely through the generosity of Mr. Fletcher, of Warrington, prizes the value of £30 are competed for annually, and the prizes at the Owens College are also open to Students at the Hospital.

The Fee for the 2 years' Hospital Practice required by the College of Surgeons is £12 12s. For further information apply to

GEO. G. CAMPION, 98, Grosvenor Street, All Saints, Dean.

LIVERPOOL.

DENTAL HOSPITAL, MOUNT PLEASANT.

Consulting Physician—Thomas Robinson Glynn, M.D., M.R.C.P., Lond.

Consulting Surgeon—Frank T. Paul, F.R C.S., Eng.

Consulting Dental Surgeons.

C. Alder, L.D.S.
H. C. Quinby, L.D.S., D.D.S.
J. E. Rose.
W. H. Waite, L.D.S., D.D.S.

Honorary Dental Surgeons.

R. M. Capon, L.D S., Glasgow.
R. H. Bates, L.D.S , Eng.
E. A. Councell, L.D.S., Eng.
R. Edwards, M.R.C.S., L.D.S., Eng.
H. Newton Hindley, L.D.S., Eng.
W. Mapplebeck, L.D.S.I.
Thos. Mansell, L.D.S., Edin.
J. N. P. Newton, L.D.S., Eng., D.D.S.
W. J. Pidgeon, L.D.S., Eng.
J. Royston, L.D.S., Eng.
M. Alexander, L.D.S.I.
T. Coyse, L.D.S , Eng.

Honorary Demonstrator of Operative Dental Surgery.

Arthur Black, L.D.S.

Honorary Anæsthetist.—J. G. Gemmell, M.B., C.M.

Stipendiary Dental Surgeon.

W. H. Gilmour, L.D.S., Eng.

Dean—R. Edwards, M.R.C.S., L.D.S., Eng.

This Hospital is a school of Practical Dental Surgery, duly recognised by the Royal College of Surgeons, and open to all Students of Dentistry, under such regulations as shall be determined by the Committee of Management.

The Hospital is open, daily, for the admission of patients from 9 till 11 a.m. and from 6. 30 to 8 p.m., except on Saturday.

Fees for Hospital Practice. £12 12s. for two years' Hospital Practice required for the curriculum. £15 15s. perpetual.

Further information may be obtained by applying to the Dean.

PLYMOUTH.

DENTAL HOSPITAL.

Bank Street Chambers, Bank Street, Plymouth.

The Dentists attend each day, at 9 a.m. except Sundays.

Certificates of attendance on the practice of this Dental Dispensary are recognized by the College of Surgeons as qualifying for the Diploma in Dental Surgery. The College also recognizes the lectures delivered at the Dispensary.

Pupils of any of the Dental Surgeons of the Plymouth Dental Hospital, or other Dentists holding a Diploma of the College of Surgeons, or Members of the Odontological Society, may attend the Hospital on the day of such practitioner as may agree to accept such pupils, on the payment of £1 1s. per annum to the institution.

A Course of Lectures will—if a sufficient number of Students present themselves—be delivered during the year.

On "Dental Physiology, Dental Anatomy, Dental Mechanics."

Fee to Lectures, one Course, £7 7s.

Fee to Lectures, double Course, £12 12s (required for Diploma.)

Fee to Dental Practice at Hospital £5 5s. per annum.

Fee to entire Dental Curriculum (required for Diploma) 22 guineas.

E. A. Bennett, Hon. Sec. and Treasurer.

DEVON AND EXETER DENTAL HOSPITAL, EXETER.

Consulting Surgeons.
A. J. Cumming, F.R.C.S., Eng.
James Bankart, M.B., Lond., F.R.C.S., Eng.
Consulting Dental Surgeon.
S. Bevan Fox, L.D.S., Eng.
Dental Surgeons.
J. T. Browne-Mason, L.D.S., Eng.
Henry Biging Mason, L.D.S., Eng.
T. G. T. Garland, L.D.S.I.
J. M. Ackland, M.R.C.S., L.D.S., Eng.
S. Mundell, L.D.S., Eng.
J. A. Mallet, L.D.S., Eng.
Surgeon Administrators of Anæsthetists.
John Mortimer, M.B., Lond., M.R.C.S. Eng.
Russell Coombe, M.A., Cantab. F.R.C.S., Eng.
Honorary Secretary.
George A. Townsend.

Attendance on the practice of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma.

The Hospital is open daily (Sundays excepted), and patients are admitted between the hours of 9 and 11 a.m.

Pupils or any member of the Staff or other registered Practitioner (being a Life or Annual Governor) are permitted to attend the Practice of the Hospital, subject to the approval of the Medical Sub-Committee, on payment of Five Guineas annually to the Funds of the Institution. Students attending the practice of the Hospital must consider themselves strictly under the control of the Medical Officers, and must not undertake any operation without the consent of the Dental Surgeon for the day.

Numbers of cases treated in 1891, 4,282.

COOKE'S SCHOOL OF ANATOMY, PHYSIOLOGY AND SURGERY,

And all Professional Subjects.

Demonstrations and Lectures by Mr. Thomas Cooke, F.R C.S.. senior Assistant Surgeon to the Westminster Hospital; and other Masters.

The School having been recognised by the London University and the Society of Apothecaries, a department for curriculum work has been formed, in which instruction will be given, meeting the requirements of the two first years of medical studies. Special advantages are offered in regard to *practical work* in Anatomy and Physiology, on the lines, in respect of the former subject, of Mr. Cooke's "Dissection Guides." It is not intended, however, to take on, for curriculum work, more than a *small number* of *specially earnest workers*, the object being to attract a few thoroughly good men, who, on their becoming *efficient practical anatomists*, will, it is hoped, take part in the "Supplementary teaching," which is the *special* aim of the Institution. In encouragement of such, an entrance Scholarship is offered for competition, conferring the privilege of free education for the two first years of the medical curriculum.

By decision of the Royal Colleges of Physicians and Surgeons, gentlemen rejected at their Anatomical and Physiological Examinations (Primary R.C.S. or Second Conjoint) can get "signed up" from this School for the three or six months' work they are now required to put in before re-examination.

The School also meets the requirements of qualified Practitioners and advanced Students, *i.e.* gentlemen wishing either to obtain some of the Higher Qualifications, or to compete for Appointments in Her Majesty's Army, Navy, and Indian Medical Services. For these, special Classes are provided.

IV.—GENERAL HOSPITALS.

CHARING CROSS HOSPITAL.

Dental Surgeon—J. FAIRBANK, M.R.C.S., *Assistant Dental Surgeon*—J. F. COLYER, M.R.C.S, L.R.C.P., L.D.S., who attend at the Hospital, three days a week, at 9 a.m., for Dental Operations. A course of Lectures on Dental Surgery is also given during January, February, and March, by Mr. FAIRBANK, and Tutorial classes three days each week throughout the year by Mr. COLYER.

Two prizes are awarded annually in the class of Lectures on Dental Surgery, of the value of six guineas and four guineas respectively. Dental Students can also compete for for the Golding scholarship of £15.

Students may serve as assistants to the Dental Surgeon for a period of three months.

The composition fee for dental students is 54 guineas, or 60 guineas, payable in two instalments of 30 guineas each.

A proporiionate reduction of the above fees will be made to those students who have completed part of the curriculum at a recognized institution.

The hours of lectures have been specially arranged to suit the convenience of dental students. Charing-cross Hospital is within three minutes walk of the Dental Hospital of London.

For further information apply to the Dean, Mr Stanley Boyd, or to the Librarian and Secretary, Mr. Francis Pink, at the office of the Medical School, Chandos Street, Charing-cross, between the hours of 10 and 4.

LONDON HOSPITAL AND MEDICAL COLLEGE.

Dental Surgeon—ASHLEY BARRETT, M.B., Lond. M.R.C.S., L.D.S.

The Council of the College of Surgeons recognize the Dental Department of the London Hospital as a school at which may be obtained the Dental Practice necessary to qualify a student for the Examination of the Dental Diploma. Dental Students may obtain the General Medical Education (that is, apart from certain special Lectures to be attended at a Dental School) and the Dental Practice necessary for the Diploma, at the London Hospital School, on payment of Forty Guineas,

A course of Lectures on the Anatomy and Pathology of the Teeth and Dental Surgery will be delivered by Mr. Ashley Barrett, on days which will be duly announced. It comprises the treatment of dental irregularities, of Dental Caries and such matters in connection with the subject as are of interest to the Medical Practitioner. Mr. Barrett gives practical instruction on Tuesdays at 9 a.m., which is open to all students of the School and can be attended by gentlemen who are not pupils on payment of a fee of Ten Guineas.

In addition to the Lectures a series of Demonstrations of the simpler modes of filling teeth will be given during the month of June. The Demonstrations will refer to the modes of Manipulating Amalgam and Gutta Percha fillings, the preparation of Cavities, the filling of Teeth containing vital and dead pulps, the mode of releving pain after filling, and the instruments needed for these operations.

A Dental Assistant is elected every three months, without any additional expense. The terms of the office date from the first Tuesday in January, April July and October. In selecting Candidates, priority will be given to those who have attended the greatest number of Lectures on Dental Pathology and Surgery, and have also been the most punctual in attendance in the Dental Department on Tuesday morning.

Further information may be obtained on application to Mr. Munro Scott, the Warden, Medical College, London Hospital.

KING'S COLLEGE, STRAND, W C.

Special arrangements are made for Dental Students. Apply to the Dean.

MIDDLESEX HOSPITAL.

Consulting Dental Surgeons—SIR J. TOMES, F.R.S., F.R.C.S., L.D.S.
J. S. TURNER, M.R.C.S., L.D.S.

Dental Surgeon—W. STORER BENNETT, F.R.C.S., L.R.C.P., L.D.S.
Assistant Dental Surgeon—W. HERN, M.R.C.S., L.D.S.

In 1887 the acquisition of a site in Cleveland Street enabled a much needed extension of the Buildings to be carried out. The additions included an additional Lecture Theatre, a physiological Laboratory and Class Room, a Student's Room, and a Luncheon Room. A new and commodious Library and a Materia Medica Museum have also been opened.

Students who intend to become Licentiates in Dental Surgery of the Royal College of Surgeons are admitted to attend the requisite courses of Lectures—which are arranged to fit in with the work at the Dental Hospitals—and Hospital Practice on payment of a fee of 54 guineas, in one payment, or by instalments of £42 on entrance, and £21 at the beginning of the Second Winter Session.

A short course of Lectures on Dental Surgery will be delivered during November and December by the Lecturer on Dental Surgery, Mr. Storer Bennett. The Lectures will be supplimented by practical Demonstrations, which will be given every week during the Winter and Summer Sessions by the Dental Surgeon and Assistant Dental Surgeon. Students of the Hospital free, others pay a fee of 2 guineas.

Further information may be obtained from Sidney Coupland, M.D., the Dean, or from the Resident Medical Officer at the Hospital.

ST. GEORGE'S HOSPITAL.

Dental Surgeon—H. L. ALBERT, M.R.C.S.

Mr. Albert attends at the Hospital on Mondays and Fridays at 1 p.m.; his assistant on Tuesdays and Saturdays, and at 1 p.m.

A course of Lectures on Dental Surgery is given by Mr. Albert in the Summer Session. Free to Students of the hospital.

Fee for general subjects in Dental Surgery, exclusive of Practical Chemistry, £55. Payable in two instalments; first year, £30; second year, £25.

Further information can be obtained by application to Dr. WHIPHAM, Dean of the Medical School.

ST. THOMAS'S HOSPITAL.

Dental Surgeon—CHARLES EDWIN TRUMAN, M.A. Cantab, M.D.C.S., L.D.S.

Assistant Dental Surgeon—Vacant.

Gentlemen may receive instruction in diseases of the teeth, are appointed dressers, and can undertake operations, subject to the supervision of the Dental Surgeons, Tuesdays and Fridays at 10 a.m.

Numerous cases of irregularity of the teeth, and the application of artificial appliances, are undertaken during the term.

The fee for attendance on the *general* subjects required of the students in Dental Surgery, is, for the two years, £65 or by instalments, £55 for the first year, and £15 for the second year.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.

Dental Surgeon—MORTON SMALE, M.R.C.S., L.D.S.

Practical instruction in Dental Operations is given on Wednesdays and Saturdays at 9 a.m. Dressers are appointed who hold office for three months.

For prospectuses and further information apply to the School Secretary.

GEORGE F. FIELD, Dean of the School.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.

Dental Surgeons—MR. PATERSON, MR. ACKERY.

Assistant Dental Surgeons—MR. READ, MR. ACKLAND.

The Dental Department of the Hospital is open on Tuesday and Friday mornings at 9 o'clock. The practice of the department is recognised by the Royal College of Surgeons.

The fee for general subjects for Dental Students for the first winter is £33 2s. 6d., for the first summer £33 2s. 6d., or a single payment of £66 3s

WESTMINSTER HOSPITAL.

Dental Surgeons—J. WALKER, M.D., M.R.C.S., L.D.S.,
LLOYD WILLIAMS. M.R.C.S., L.D.S.

Dental Department.

The Dental Surgeons, Dr. Walker and Mr. Lloyd Williams, attend at 9.15 a.m. on Wednesdays and Saturdays respectively.

Dr. Walker attends at 9.15 a.m. on Wednesdays, and Saturdays at for practical demonstration of diseases and operations of the teeth.

The fee for attendance on the Dental Practice is £2 2s. for three months, and £3 3s., for six months. The whole of the General Lectures and Surgical Practice required for the Dental Diploma of the College of Surgeons can be attended for 50 guineas in one sum on entrance, or for two sums of £30, and £26 payable at the beginning of each year.

Dr. Walker will deliver a course of Lectures on Dental Surgery and Pathology at an hour to be determined at the commencement of the Session.

A scholarship value £20 is offered annually in September for Competition to commencing Dental Students.

SCHOOL OF MEDICINE, SURGEON'S HALL, EDINBURGH.

The Fees required for students attending general subjects necessary for the curriculum of the Royal College of Surgeons, Edinburgh, are the same as those for the Conjoint Examining Board, as Candidates for the L.R.C.S.E. require to be in possession of a recognised Diploma in Medicine.

GUY'S HOSPITAL.

A Dental School has recently been added to the Hospital.
Dental Surgeon.—F. Newland-Pedley, F.R.C.S., L.D.S.E.
Assistant Dental Surgeon—W. A. Maggs, L.R.C.P., M.R.C.S., L.D.S.E.

FEES.

A Ticket which gives admission to the General and Special Lectures and Demonstrations, and to the Hospital Practice, may be obtained :—

1. By payment of £90 on entrance.
2. By two payments of 50 guineas, and 40 guineas at the beginning of the First and Second Years respectively.

A Ticket which gives admission to the Special Lectures and Demonstrations and Dental Practice only may be obtained for 30 guineas paid on entrance.

HARVARD UNIVERSITY DENTAL DEPARTMENT, BOSTON, MASS., U.S.A.

The Sessions of this School begin the last Thursday in September, and end the last Wednesday in June, making nine months of practically continuous work in each year.

General Anatomy, with Dissections, Physiology, and General Chemistry, are the studies of the first year. Of the second year they are Operative and Mechanical Dentistry, Materia Medica and Therapeutics. Oral Anatomy and Physiology, Bacteriology, and Surgical Pathology. Of the third year Operative and Mechanical Dentistry, Crown and Bridge work, and Orthodontia. The Student can also attend gratuitously all the *lectures* in any other department in the University.

The Infirmary furnishes abundant facilities, averaging 8,000 operations, of which a large proportion consists of filling teeth, every year.

The University degree D.M.D. (Dentariæ Medicinæ Doctor) is conferred on all who fulfil the requirements.

The Diploma is recognized by the English Medical Council, except for British subjects.

For the first year a student is a member of the school the fee is 200 dols.; for the second year, 150 dols., and for any subsequent year, 50 dols.

For further information and catalogues, address, Thomas H. Chandler, Dean, 191, Newbury Street, Back Bay, Boston, Mass., U.S.A.

THE DENTAL COLLEGE OF THE UNIVERSITY OF MICHIGAN.

The Eighteenth Annual Session of this Institution will commence on the 1st of October. and close on the last Thursday of June, thus making a course of nine months. A preliminary examination, having reference to general education attainments, is required.

The Student in this department will receive instructions in Anatomy, Physiology, Pathology, Chemistry, Materia Medica, Therapeutics, Surgery, and Hygiene, from the professors of their respective branches in the *Departments of Medicine and Surgery* of the University, when lectures commence and continue the same as with the Dental College.

FACULTY OF THE DENTAL DEPARTMENT.

President.

JAMES B. ANGELL, LL.D.

Dean.

JONATHAN TAFT, M.D., D.D.S.
Professor of Oral Pathology and Surgery.

CORYDON L. FORD, M.D., D.D.S.
Professor of Anatomy and Physiology.
JOHN A. WATLING, D.D.S.
Professor of Operative and Clinical Dentistry.
WILLIAM H. DORRANCE, D.D.S.
Professor of Prosthetic Dentistry and Dental Metallurgy.
NEVILLE S. HOFF, D.D.S.
Professor of Dental Materia Medica and Dental Mechanism.
CYRENUS G. DARLING, M.D.
Clinical Lecturer on Oral Pathology and Surgery.
LOUIS P. HALL, D.D.S.
Assistant to the Professor of Operative and Clinical Dentistry.
ALLISON W. HAIDLE, D.D.S.
Demonstrator of Prosthetic Dentistry and Dental Mechanism.

Lecturers in the Department of Medicine and Surgery to Dental Students.

ALBERT B. PRESCOTT, Ph. D., M.D.
Qualitative Chemistry.
WARREN D. LOMBARD, Ph. D., M.D.
Physiology.
WILLIAM A. CAMPBELL, M.D.
Practical Anatomy.
FREDERICK G. NOVY, Sc. D.
Bacteriology.
GOTTHELF C. HUBER, M.D.
Histology.
DAVID M. LICHTY, M.S.
General Chemistry.

Special instructions will be given in Dental Pathology, Oral Surgery, Dental Therapeutics, and diseases of Women and Children, with reference to the teeth.

FEES AND EXPENSES.

The fees, which must be paid in advance, are as follows:

RESIDENTS OF MICHIGAN.—Matriculation, 10.00 dols. Annual dues, 25.00 dols.

NON-RESIDENTS.—Matriculation, 25.00 dols. Annual dues, 35.00 dols.

For the various Laboratories, 35.00 dols.

GRADUATION FEE.—For all alike, 10.00 dols. The matriculation fee is paid but once, and entitles the student to the privilege of permanent membership in any department of the University. The Annual due is paid the first year and every year thereafter while at the University.

IV.—SCIENTIFIC ASSOCIATIONS.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN, 40, LEICESTER SQUARE.

Officers for 1892.

President—J. Howard Mummery.

Vice-Presidents.

Resident.
David Hepburn.
T. H. G. Harding.
R. H. Woodhouse.

Non-Resident.
W. B. Macleod, (Edinburgh.)
J. H. Redman, (Brighton.)
F. H. Balkwill, (Plymouth.)

Treasurer—Thomas Arnold Rogers.

Librarian—Ashley Gibbings.

Curator—Storer Bennett.

Editor of the Transactions—Walter Coffin.

Honorary Secretaries.

J. Ackery (Council),
W. A. Maggs (Society),
F. H. Weiss (For Foreign Correspondence).

Councillors.

Resident.
W. Hern.
F. Newland-Pedley.
C. J. Boyd Wallis.
F. J. Bennett.
Cornelius Robbins.
F. G. Betts.
Morton Smale.
B. J. Bonnell.
E. Lloyd Williams.

Non-Resident.
W. B. Bacon (Tunbridge Wells).
H. B. Mason (Exeter).
Mordaunt A. de C. B. Stevens (Paris).
T. S. Carter (Leeds).
W. S Woodburn (Glasgow).
W. H. Williamson (Aberdeen).
H. C. Quinby (Liverpool).
D. W. Amoore (St. Leonards).
Wilson Hogue (Bournemouth).

Extract from the Bye-Laws.

Objects and Constitution of the Society.

The Society is instituted for the encouragement and diffusion of knowledge in Dental Surgery, and for the promotion of intercourse among Members of the Dental Profession.

The Society shall consist of Resident, Non-Resident, Corresponding, and Honorary Members *

1. The Resident Members shall consist of gentlemen residing or practising wholly or partly in London or within ten miles of General Post Office, St. Martins-le-Grand.
2. The Non Resident Members shall consist of gentlemen wholly practising beyond ten miles from the General Post Office.
3. The Corresponding Members shall consist of distinguished gentlemen residing in the Colonies of Great Britain or Foreign Countries.
4. The Honorary Members shall consist of distinguished Practitioners of Dental Surgery who have retired from practice, of distinguished Medical Practitioners, and of gentlemen distinguished in any department of Science.

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* Candidates for the Resident, Non-Resident, or Corresponding Membership of the Society shall not be eligible unless they practice as Dental Surgeons, or are interested in the progress of Dental Surgery, and are also Licentiates in Dental Surgery, or qualified Practitioners of Medicine or Surgery: or possess such a Diploma or Degree as in the opinion of the Council, will qualify them for the Membership of the Society.

Persons who advertise in the public journals, or by circular, either their profession or their professional attainments or public appointments, or anything relating to their mode of practice or charges, or who expose for public inspection specimens of operative or mechanical Dentistry, or conduct their practice in any way which in the opinion of the Council of this Society, is derogatory to the respectability of the Profession, shall not be considered eligible for nomination as members.

No person being the proprietor of a secret remedy, or holding a patent relating to the requirements of Dental Practice, shall be a member of this Society.

Election and Admission of Resident and Non-Resident Members.

Candidates for Resident Membership shall be recommended by four or more Members, two at least signing from personal knowledge. Candidates for Non-Resident Membership shall be recommended by three members, one at least signing from personal knowledge.

All recommendations for resident or non-resident members shall be submitted to, and approved of, by the Council, before being proposed to the Society for ballot.

Contributions of Members.

Every person elected a Resident Member shall pay Three Guineas as an Admission Fee and an Annual Subscription of Two Guineas, *in advance.*

Every person elected a Non-Resident Member shall pay Two Guineas as an Admission Fee and an Annual Subscription of One Guinea in advance.

The Entrance Fees and First Annual Subscriptions shall be paid on admission, and the subsequent Annual Subscriptions in the month of November in each year; but new members proposed at or after the Annual Meeting, shall not be required to pay any Subscription for the current Session.

Ordinary Meetings.

The Ordinary Meetings of the Society shall be held on the first Monday in each month, from November to June, both inclusive, at 8 p.m. precisely, except in the month of January, or when an Act of Parliament holiday occurs on that day, the meeting shall be held on the Monday next ensuing.

Each Member may introduce two Visitors at these Meetings on writing the Visitors' names in a book to be kept for that purpose. The same Visitors will not be admitted more than three times during one Session.

Annual General Meeting.

The Annual General Meeting of the Society for the election of the Officers and Councillors, &c., shall be held on the evening of the second Monday in January every year.

Society's Transactions.

Ths Transactions of the Society, under the designation of "Transactions of the Odontological Society of Great Britain," shall be printed at such times and in such manner as the Council shall direct.

The "Transactions" shall be presented to all Resident and Non-Resident members of the Society who have paid their Annual Subscription.

ODONTO-CHIRURGICAL SOCIETY OF SCOTLAND,

5, LAURISTON LANE, EDINBURGH.

President—G. W. WATSON, L.D.S.

Vice-Presidents.

J. STEWART DURWARD, L.D.S. | JOHN STIRLING, L.D.S.

Treasurer—JAMES MACINTOSH, Esq.

Secretary—JOHN S. AMOORE, L.D.S. Eng., 7, Abercromby Place.

Curator and Librarian—J. GRAHAM MUNRO, L.D.S.

REES PRICE, L.D.S., Eng. | ANDREW WILSON, L.D.S.
J. AUSTIN BIGGS, L.D.S. | W. NORMAN MACLEOD, L.D.S.

Ordinary Meetings.—The Society meets on the second Thursdays of November, December, January, February and March.

EXTRACTS FROM THE CONSTITUTION AND LAWS.

Name and Objects.

The Society shall be named the "Odonto-Chirurgical Society," and shall have for its objects the Promotion and Diffusion of Knowledge in matters connected with Dental Surgery; the furtherance of communications on such subjects by members of the Society; and otherwise to advance the interests of Dental Surgery as a branch of Medicine.

Ordinary and Honorary Members.

The Society shall consist of Ordinary, Honorary, and Corresponding Members.

The Ordinary Members shall consist of Gentlemen practising as Dentists in Great Britain, and of Medical and Surgical Practitioners interested in Dental Surgery.

The Honorary and Corresponding Members shall consist of Gentlemen practising Dentistry in Great Britain, in the Colonies, or in Foreign Countries, and of retired Dental Practitioners in Britain, as well as such Medical or generally Scientific men as may have distinguished themselves in cennection with Dental Surgery.

The Ordinary Members shall have vested in them the Government of the Society, and all cases not otherwise specified shall be decided by them by a majority of votes by ballot, if required,

Obligations of Members.

No Member shall be permitted to advertise his profession, his modes of practice, or his charges, either in the public journals or by circular. They shall not be permitted to expose specimens of their work for public inspection, nor to carry on their practice in connection with any other business, nor to hold any patent relating to Dental practice, nor to conduct themselves in any way which the Society may consider derogatory to the Profession, so long as they continue members of the Society. But members who practise in towns other than that in which they reside shall be allowed to intimate their visits: such intimations being subject to the approval of the Council.

Applications for Membership.

Candidates for admission as Members of the Society shall be recommended by an Ordinary Member, and the recommendation seconded by another. After being approved by the Council, such recommendation shall be read to the Society at an Ordinary Meeting, and shall lie over to the next, when the Candidate shall be balloted for, when two-thirds of the Members present must be in his favour to secure his election.

Contributions.

Ordinary Members residing within a ten-mile radius of the City shall pay an Entrance Fee of One Guinea, and One Guinea of an Annual Subscription in advance. All other Ordinary Members shall pay an Entrance Fee of One Guinea, and Ten Shillings and Sixpence of an Annual Subscription. All Annual Subscriptions to date from the 1st March preceding the Candidate's admission.

THE BRITISH DENTAL ASSOCIATION,

(*Incorporated June* 3rd, 1880,)

40, LEICESTER SQUARE, LONDON.

President—H. C. QUINBY, L.D.S.I.

Vice-Presidents.

SIR EDWIN SAUNDERS, F.R.C S.
Dr. JOHN SMITH, F.R.C.S , Edin.
SIR JOHN TOMES, F.R.S., F.R.C.S., L.D.S., Eng.

Treasurer—W. H. WOODRUFF, L.D.S., Eng.

Secretary—W. B. PATERSON, F.R.C.S., L.D.S., Eng.

Extracts from Memorandum of Association and Bye-laws.

The objects for which the Association is established are the promotion of Dental and the allied Sciences, and the maintenance of the honour and the interests of the Dental Profession by

"The Periodical meetings of the Members of the Association and the Dental profession generally, in different parts of the country.

"The publication of a periodical journal, and by

"The maintenance of the spirit and provisions of the Dentists' Act, by such lawful means as may be necessary, &c., &c."

Extracts from the Bye-laws.

A person who is registered in the Dentists' Register shall be eligible for election as a member of the Association, provided that he be of good character; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a showcase exposed to public inspection; or by means of public advertisements or circulars, describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any registered practitioner not disqualified by any Bye-law who shall be recommended as eligible by any three Members of the Association (the recommendation of one being from personal knowledge), and who has signed the appended form of application for admission and agreement as to terms of Membership, may be elected a Member by the Representative Board or by the Council of a recognized Branch.

The subscription is one guinea per annum, and each member is entitled to a copy of the Journal of the Association monthly, and to attend the Annual Meetings of the Association.

THE MIDLAND BRANCH OF THE BRITISH DENTAL ASSOCIATION.

EXTRACT FROM BYE-LAWS.

1. Composed of Members of the British Dental Association who reside in the Midland and North Western Counties of England, and of Associates who can fulfil the conditions laid down in the Bye-laws. The Annual Meeting takes place in May.

2. The Association shall consist of Members and Associates. No one shall be eligible for membership who is not already a member of the British Dental Association. Any registered Practitioner of good character, who does not conduct his practice by means of the exhibition of Dental specimens, appliances or apparatus in an open shop, or in a window, or in a showcase exposed to public inspection: or by means of public advertisements or circulars describing modes of practice; or patented or secret processes; or by the publication of his professional charges, may be admitted as an Associate. Associates shall be entitled to all the privileges of the Branch Association, but shall not be entitled to vote or hold office therein.

3. Any member of the British Dental Association may be elected a Member of the Branch by the Council of the Branch, at any of their ordinary Meetings, on his sending a written application for election to the Secretary of the Branch.

4. Any registered Practitioner who can subscribe to the conditions laid down in Bye-law 2, and who shall be recommended as eligible by any three members or Associates, may be elected an Associate by the Council, on his forwarding the recommendation and his subscription to the Honorary Secretary of the Branch.

BRITISH DENTAL ASSOCIATION, WESTERN BRANCH.

A person who is registered in the Dentists' Register shall be eligible for election as a Member of this Branch, provided he be of good character; that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus in an open shop, or in a window, or in a show case exposed to public inspection; or by means of public advertisements; or circulars describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges.

Any dental practitioner who can subscribe to the conditions laid down in Bye-law 4, who has been recommended as eligible by any of those members of this Branch, may be elected a Member by the Council, and shall be admitted a Member of the British Dental Association.

BRITISH DENTAL ASSOCIATION.
EASTERN COUNTIES BRANCH.

Districts.

Norfolk, Suffolk, Cambridgeshire, Essex, Lincolnshire, Northamptonshire, Bedfordshire, Hertfordshire, and Bucks.

Bye Law.

Any Registered Dental Practitioner, who shall be recommended as eligible by any three members of the Branch, (one being from personal knowledge,) may be elected a member by the Council. The election to be by ballot; three black balls to exclude.

METROPOLITAN BRANCH OF THE BRITISH DENTAL ASSOCIATION.

Composed principally of members of the British Dental Association practising within the London postal district. The Branch meets three or four times a year, and the Annual Meeting is held in January.

The qualifications of Membership are similar to those in the other Branches.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LONDON, LEICESTER SQUARE, W.C.

The object of the Society is the consideration of matters specially appertaining to Dentistry. The affairs of the Society are managed by a Council consisting of a President, two Vice-Presidents, Treasurer, two Secretaries, Curator, and nine other members. The President is chosen from the past Students who have obtained their degree of L.D.S.; the Vice-Presidents from past Students with or without qualification.

Any gentleman wishing to become a member, must be proposed and seconded at one meeting, and be balloted for the next; one black ball in four to exclude. The entrance fee for ordinary members is half-a-crown, and there is an annual subscription of the same amount.

Ordinary meetings are held at 8 p.m. on the second Monday in every month, from October to March inclusive. The annual meetings for the election of officers and other business is held on the third Monday in January in each year.

Every member has the power of introducing one visitor, not being a Student of the Hospital or School, to the meetings, with the consent of the President. Visitors are invited to take part in the discussion of the papers and clinical cases.

There is a Library and a Museum in connection with the Society, both being under the superintendence of the Curator.

The Council offer a prize, value £3 3s., at the end of each year, for the best paper read before the Society during that year.

STUDENT'S SOCIETY OF THE NATIONAL DENTAL HOSPITAL AND COLLEGE.

This Society, which was established March 16, 1878, was constituted for the encouragement and diffusion of knowledge in Dental Science, and for the promotion of intercourse among its Members: and all Students of Dental Science are eligible for Membership. All candidates for Membership must be approved by the Council before being proposed to the Society for election. The Entrance Fee is 2s 6d. to be paid in advance. The Ordinary Meetings of the Society are held on the first Friday in each month, from October to June, both inclusive at 8 p.m. precisely. Each Member may introduce two visitors, not being Students of the Hospital or College, but the same visitors may not be admitted more than three times during one Session.

STUDENTS' SOCIETY OF THE DENTAL HOSPITAL OF LIVERPOOL.

This Society is constituted for the consideration of matters generally and specially appertaining to Dental Surgery.

Candidates for membership must be approved by the Council before being proposed to the Society for election. Such proposals are posted during one meeting of the Society, and remain so posted until the next monthly meeting when the candidate is balloted for. No candidate is elected unless he have the votes of two-thirds of the members present. Eight to form a quorum.

Every member has the power of introducing two visitors, not being Students of the Hospital or School, to the evening meeting, with the consent of the President.

An ordinary meeting is held on the third Friday in every month, from October to March inclusive; the chair is taken at eight o'clock p.m. The annual meeting for the election of officers and other business will be held in January, next year, on the third Friday to receive the Treasurer's and Secretary's next report.

THE STUDENTS SOCIETY OF THE VICTORIA DENTAL HOSPITAL OF MANCHESTER.

The object of the Society is the consideration of matters generally and specially appertaining to Dental Science, and for the promotion of intercourse amongst its members.

The affairs of the society are managed by a Council consisting of a President, two Vice-Presidents, Treasurer, two Secretaries, Curator and Librarian, and not more than four Students of the Hospital.

The General Meeting is held on the last Tuesday in every month from October to March inclusive and the Annual Meeting is held in May of each year.

Every member has the power of introducing two Visitors not being Students of the Hospital to a General meeting with the consent of the President.

British Journal of Dental Science.

No. 593. LONDON, OCT. 1, 1892. Vol. XXXV.

HOW TO GIVE GAS.

By Thomas Edward Constant, M.R.C.S., L.R.C.P., L.D.S., Eng.

Preface.

Since the following pages were written, an admirable paper has appeared in the *Lancet* in which the author, Dr. Silk, has drawn attention to the very imperfect arrangements made at the various medical schools for imparting to the students knowledge of the anæsthetics in general use. At the majority there is no regular course of instruction at all; and, in the few where such exists, the attendance of the student thereat is not compulsory. Moreover, this subject is not specially included in the examinations of the various Colleges which grant diplomas to practise medicine and surgery, and, as a result, every practitioner might, and an extremely high percentage do, obtain their qualification without either a practical or theoretical knowledge of the methods by which anæsthesia is generally induced. Everything stated by Dr. Silk with regard to anæsthetics in general, applies still more fully to nitrous oxide in particular. Not a few of the medical practitioners of to-day have never in their lives seen gas administered. Yet so many of the minor surgical operations that day after day it falls to their lot to perform (which, although very painful are not of sufficiently grave character to render the administration of ether or chloroform absolutely necessary) are just the cases where nitrous oxide would be useful. The dentist has learned to regard gas as indispensable, and few medical practitioners would be without it if they were only as familiar with its use. The reason why they are not so is obvious. The class of case in which they would find it most useful, is that which, during their hospital career, came under their notice in the out-patient room, where the administration of an anæsthetic would entail too great a loss of time. To the dental student, however, its administration is a matter of every-day experience, and very few receive their qualification before they have witnessed or even undertaken its administration scores, I may say hundreds, of times. The fact that a dental surgeon may have to use it several times where a medical practitioner would require it once, is no argument in favour of the latter's ignorance of its use ; and the anomaly of the dentist combining both the duties of operator and anæsthetist would become far less common were the doctor more competent to relieve him of the greater responsibility. How he may do this it is the object of this little treatise to indicate. Its purpose is purely practical, and if information other than that is required the reader is referred to the many works upon anæsthetics in general, as I am writing only for such as are anxious to know enough of nitrous oxide to enable them to administer it safely and satisfactorily. As it will for a long time to come be more used for dental operations than for those of general surgery, its administration is described chiefly in relation to the former class of case. Partly to avoid circumlocution, and partly because the views and opinions expressed are founded upon my own experience, I have written in the first person ; and this must be accepted as my apology, if any be needed, for the somewhat frequent appearance of the egotistical pronoun. Moreover, as it has been my object that the diction should be lucid rather than elegant, the literary subtleties that adorn papers of a more pretentious character would be here sought for in vain.

Nitrous Oxide, when properly administered, is the safest of all known general anæsthetics. Yet more than two-thirds of the registered medical practitioners of the United Kingdom are more or less incompetent to administer it. This statement is not lightly made, neither is it written in a spirit inimical to the medical profession; nevertheless, it is a fact, and forms the *raison d'etre* of the present treatise.

The opportunities afforded the medical student of witnessing the administration of gas are few and far between, as it is seldom employed at general hospitals, except as a preliminary to the administration of ether. The incompetence referred to is therefore more to be regretted than wondered at; but, as a result of it, it has, unfortunately, become the rule among dentists practising in districts where it is impossible to obtain the services of a professed anæsthetist, to administer gas without the assistance of a medical man. This they do, in most cases, because they have found that, as a rule, when, at the express desire of some patient, a doctor has been called in, as a result of his lack of knowledge of the anæsthetic employed, his presence, although lightening them of their legal, has not in the least lessened their moral responsibility.

In the following pages it is my object to give an account as clearly and concisely as possible, with the help of the admirable illustrations kindly lent me by Messrs. Ash & Sons, of the best method of administering this most useful anæsthetic, together with a description of the apparatus employed.

At the same time many little things will be pointed out with which my observation of the methods used by the skilled anæsthetists of the London Dental Hospital, rendered me acquainted, besides a few that my own experience suggests. This is done in order that any member of the medical profession who is desirous of becoming acquainted with the proper method of producing anæsthesia with nitrous oxide, may attain his object by careful study of the principles here enunciated, at least so far as it is possible to acquire such knowledge without practical experience. Moreover, it shall be my endeavour to show how such an one may be of real service to a dentist when the latter is extracting teeth for a patient under gas, instead of being, as at present, a mere spectator during the operation.

I venture to hope, too, that even dentists of much experience in its administration will find a few hints that may be of service ; although, of course, they will read much that, to them, would appear elementary.

It will be as well to commence by giving a detailed description of the apparatus that I consider the best. That such is necessary may be learnt from the fact that quite recently a medical man of some standing expressed surprise when he discovered that gas was portable. Indeed, there is no doubt that it is only through ignorance of the apparatus employed, and the method of administering gas that many practitioners give ether or even chloroform in minor operations, where the first-named anæsthetic would be far preferable ; and if they were only more familiar with the use of gas, deaths from chloroform would be less frequent, for in nitrous oxide we have an agent that removes one of the great objections to ether, which anæsthetic would almost entirely replace chloroform had the anæsthetist gas wherewith to precede its administration.

Description of Apparatus.

Nitrous oxide being a gas is usually confined for storage and use in steel or iron bottles of varying capacities, into which it is forced at high pressure. For ordinary purposes the bottles that hold fifty gallons are the most convenient. These bottles are in reality iron cylinders about nine inches long and three in diameter, fitted with a tap at one end, by unscrewing which the gas is allowed to escape in such quantities as may be needed. An illustration of two such gas-bottles, together with an apparatus shortly to be described, is seen in Fig. 1.

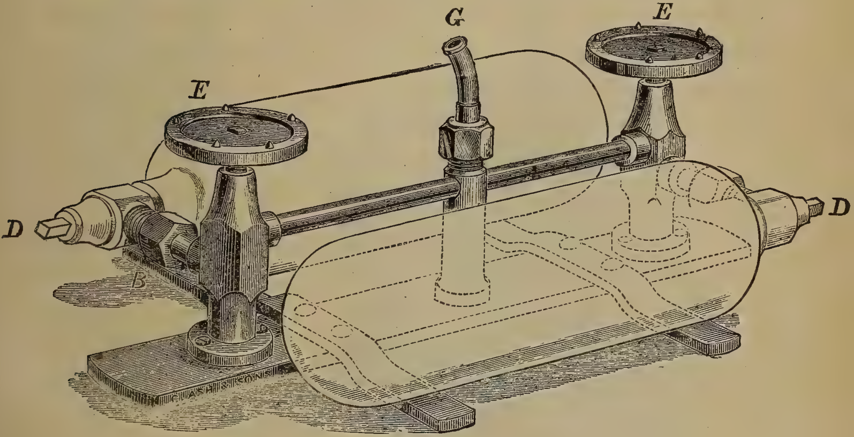

Fig. I.

Now, it is quite obvious that gas could not be inhaled directly from such a cylinder. Therefore, for its administration it is conducted by an india-rubber tube which is fixed over the outlet of the cylinder into an air-tight bag which can be filled from time to time as it is emptied by the inhalations of the patient.

The best form of this part of the apparatus is Dr. Hewitt's, of which an illustration is here given (see Fig. 2). B shows the bag which receives the gas from the cylinder. H is a handle of a stop-cock which, when turned in the direction shown in the cut, prevents the gas from escaping from the bag, but allows the patient to inhale air through the hole near it. This hole is indicated in Fig. 2 by an arrow passing through it towards the face-piece. When the handle is turned in the opposite direction the hole is closed, and the patient inhales the gas from the bag. Inside the stop-cock immediately above the handle is a valve, not shown in the cut, that allows the gas to pass outwards to the patient but prevents its return to the bag. Expired gas passes outwards in the direction indicated by the upper arrow, which passes through a valve that admits of the passage of the expired gas, but prevents the admission of air during inspiration. The tap T when turned in the opposite direction to that here represented controls both of these valves so that the patient breathes into and from the bag. The face-piece shown here is easily detachable, and is of a shape that renders it capable of being thoroughly cleaned, —a very important consideration.

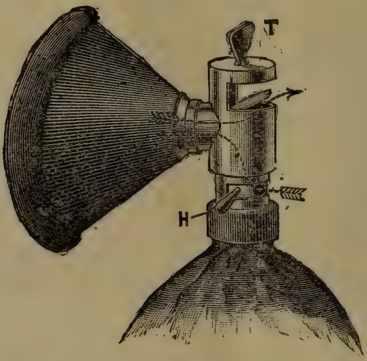

Fig. 2.

With the apparatus I have thus far described, any medical practitioner should have no difficulty in administering gas efficiently, but I shall also briefly describe one or two other forms of apparatus that are in general use, so that, when occasion requires it, he may be familiar with them. To commence first with the more old-fashioned :—

Fig. 3 represents a Gasometer with apparatus for adminis-

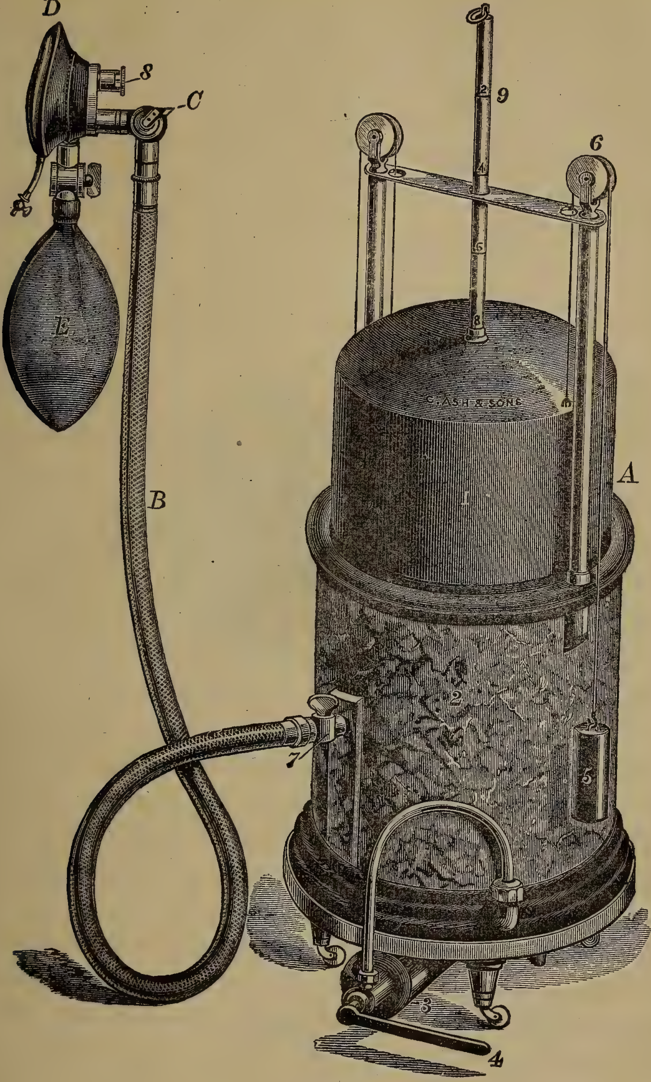

Fig. 3.

tering attached. Fixed underneath the gasometer is seen a gas-bottle such as already described. From this the gasometer is filled with gas.

I may here remark that the gasometer is now only a relic of the time when it was customary for dentists to manufacture their own gas ; the method now used of administering it direct from the gas-bottle with the intervention of a bag is less costly, more convenient, and in every way better. However, as it still finds favour with some dentists, I will here describe it.

The gasometer being filled with gas, and the outlet tap (marked 7 in fig.) being turned on, the gas passes into the tubing B, where it is checked at C by a stop-cock. It is as well to turn on the stop-cock C before the gas is turned on from the gasometer, so that the air is expelled from the tubing ; and the gas being then controlled by the stop-cock C, all is ready for administration. But I must now give a brief description of the face-piece here shown.

When the stop-cock C is turned on, the patient can inhale the gas from the gasometer, return of the gas being prevented by a valve (not shown in the cut) but which could be seen by looking inside the face-piece. The expired gas passes out by a valve at the point marked 8. At the lower part of the face-piece, is a supplemental bag, (marked E in the fig.) which is used by some dentists to economise gas, by others because they believe a little asphyxia to be a desirable adjunct to the anæsthetic effect of the nitrous oxide. In my opinion, however, this method cannot be too strongly condemned, and I should advise any practitioner who is called upon to administer gas with the apparatus in question, to refrain from using this unnecessary and harmful receptacle and to allow the patient to continue to breathe fresh gas from the gasometer until anæsthetised. This, of course, can be done by allowing the tap leading to the respiratory bag to remain turned off, and by not controlling the expiratory valve.

Fig. 4 represents another form of face-piece and stop-cock, with which gas can be administered either from a bag or from a gasometer. When the stop-cock is at its lowest point A, the patient is simply breathing air ; when it is raised to B, the patient is breathing fresh gas from the bag at each inspiration ; when it is raised to C, the patient is breathing gas into and from the bag.

Fig. 5 represents another face-piece in which the gas is admitted at B, and expired from a valve at A, E being a mount for a supplemental bag.

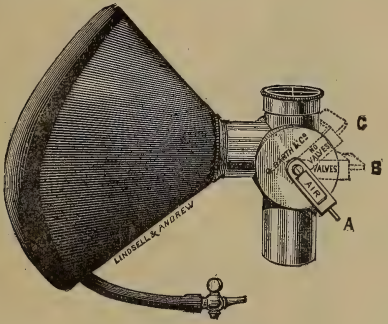

Fig. 4.

Sufficient varieties of apparatus have now been described to enable the administrator to comprehend at a glance the method of using any form of apparatus generally employed by dentists ; and, repeating that some considerable experience of most forms here described has decided me in favour of that known as Dr. Hewitt's, I will pass on to a description of other accessory appliances which, although not absolutely essential, are of great assistance to the administrator.

Now, from what has gone before it is obvious that to administer nitrous oxide with this apparatus it would be necessary to have an assistant to turn on the tap of the gas bottle, in order to admit the gas to the bag as required. I will therefore describe a very convenient form of apparatus which enables the administrator to turn on the gas for himself with his foot, and so to have the whole entirely under his own control.

Fig. 1, to which the attention of the reader was directed in describing the form of a gas-bottle, shows also a twin gas-bottle stand known as Weller's. This consists, as seen in the cut, of a flat piece of brass across which are rivetted two other pieces upon which the gas-bottles lie. From the ends of the first piece rise two upright stands which are connected above by a brass tube which is continuous at each end with the tubes to which the nozzle of each gas-bottle is screwed. At the top of each upright is a pedal screw, which, when the gas-bottles are turned on at their taps D, prevents the gas passing into the tube connecting the two uprights. At the middle of this tube is the main outlet G, from which gas can pass from either bottle into the tube of the gas-bag, from which the patient is to be anæsthetised. If both bottles are turned on at their taps D and D, but the foot keys E and E are turned off it is obvious that no gas can pass through the main outlet G; while by turning on either of these gas will

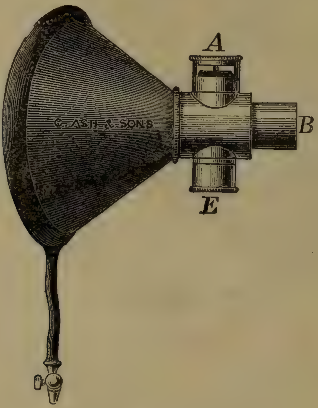

Fig. 5.

immediately pass from the corresponding bottle. The advantage of this is that should one cylinder become empty during administration, the other can at once be turned on by the foot of the anæsthetist, so that he is practically sure that if he uses gas from only one cylinder until that is emptied, he is certain to have a full one to fall back upon in any emergency.

At the same time, gas can just as easily be administered with this apparatus from a solitary cylinder by turning off the foot key at the end opposite to that where it is attached.

There are many forms of pedal attachments for turning on the gas, each of which has its particular advantages, but the one described may be taken as fairly typical of the whole of them.

(*To be continued*).

SYPHILIS, AND ITS RELATION TO DENTAL SURGERY.*

By Fred. T. Haycroft, L.D.S., Eng.

Mr. President and Gentlemen,—Perhaps this somewhat strange subject will require a few words by way of preface or introduction, seeing it is one which is rather outside the pale of ordinary practice, and also one or two reasons for having selected it.

During the past year, several good papers were read on the various every-day operations in the Surgery ; for instance, the treatment of dead teeth, gold fillings, regulating teeth, &c.,—subjects, as you will all remember, which were treated in such a manner as to leave no room for anyone, at least for me, to make any addition in the form of another paper.

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* A paper read before the Students' Society, National Dental Hospital.

Having consented to read a paper, I must confess that I was sorely at a loss for a subject. I thought of the various branches of our profession, but found that its fields had been traversed already, and its flowers culled before me.

Happening to be in the Extracting Room, one morning, I there saw a very good specimen of a syphilitic tooth, and that helped to give me the idea of writing the present paper. Another reason for having selected it is its interest and importance to three classes of people.

Firstly : To ourselves as dental practitioners and students, that we should be able to recognise any of the syphilitic lesions, and also to be careful in operating upon suspicious-looking mouths, as a wound from an elevator or forceps, has been known, according to Tomes, to infect the operator.

Secondly : To the patients suffering from this disease, so that they may receive the benefit of our services so far as we are warranted in giving them.

Thirdly : To those more fortunate patients who are free from this horrible malady ; so that there is no chance of their being infected by our using uncleanly instruments, which perchance have just been used in a syphilitic mouth.

And here, for one moment, let me strongly advise the younger members of our Society to always dip their forceps into the bowl of carbolic acid before they use them again for the next operation. And now—

What is Syphilis ?

I cannot do better than answer this question in the words of Professor Erichsen :—" Syphilis is a specific disease, or general infective process resulting from the inoculation of a specific virus, which multiplies in the system till the whole body is infected. It is communicated by the contact of the blood, secretions or discharges of a person suffering from syphilis with an abraded surface of a healthy individual; and under certain circumstances it is also transmitted from syphilitic parents to their offspring." Syphilis has been divided into two classes:—the Acquired and the Congenital; and both of these classes come before our notice. Here, let me say, that in speaking of Syphilis, I am not including the chancroid or soft non-infecting sore, which entails no constitutional disturbances.

It is my intention this evening to first give a brief survey of the disease, before I touch upon the points which have a special bearing with us.

Of course, the chief *source of contagion* is impure sexual intercourse; but, alas! there are other causes of a totally different and innocent nature; thus an accoucheur, or a midwife, has been known to take it when attending a syphilitic woman, and nurses have been known to be infected when suckling the children of diseased parents; while seemingly harmless practices, such as kissing, the use of borrowed pipes and borrowed tooth-brushes, have been known to carry the infection; and, as we read in Tomes' Dental Surgery, whistles, or tin trumpets sold in the streets, are not without their dangers. Sometimes it is communicated in the process of vaccination by means of infected lymph.

Having given a few of the means of communication, I shall now proceed to the *Period of Incubation*, which extends from the time of inoculation to the appearance of local signs at seat of infection. This period lasts from 10 days to 6 or 7 weeks, generally for about 3 or 4 weeks.

The Primary Sore then appears, usually in the form of a papule which shows itself on the seat of infection. Its characteristic is the extreme hardness of the base, which feels as if a little piece of cardboard had been slipped in under it.

It is also brownish-red in colour, elastic and firm, and there is little or no pain. This papule usually ulcerates superficially, presenting then a sharply-cut shallow excoriation, with a smooth pale red base secreting a little watery fluid, and surrounded by much induration.

About ten days after the appearance of the hard sore, the nearest lymphatic glands enlarge, and form hard swellings of a roundish shape. These usually do not reach a large size, and remain distinct from each other, and do not affect the surrounding tissue. Mr. Holmes points out that the nature of the accompanying bubo is, perhaps, the most reliable sign; it is hard like a bullet, affects several glands, and will rarely suppurate. If unmodified by treatment, the sore tends slowly to disappear, and the induration melts away, usually in about four weeks.

After Syphilis has been latent during a period of say a month or two, during which the patient suffers from a general sense of malaise or indisposition, with perhaps loss of flesh and neuralgic pains in the head, the *secondaries* appear. These are a sore throat, due to ulceration of the soft palate, and the pillars of the fauces, affecting the tonsils later on; skin eruptions, which are rashes of various kinds; a tendency to baldness; iritis, or mucous tubercles where the skin shades off into the mucous membrane. During this time, the lymphatic glands in the other parts of the body are becoming enlarged and indurated.

The secondary symptoms may end in two months, or may extend over a year.

When this stage has come to an end, the patient may never suffer again from any symptom of the disease, if he has been properly treated; or, if neglected, he may at once proceed to the tertiary stage. Usually, there is a period of from several months to two or three years.

The Tertiary Stage is characterised by ulcers on the skin which have a tendency to spread widely, and to cause considerable destruction of tissue; by chronic induration of organs; and by the development of masses of new tissue, forming definite tumours, which may break down and ulcerate their way through any structure. These are the syphilitic gummata, and attack any part of the body. Not only does a gumma attack soft structures, but it also extends to bone. If one might use the phrase, the favourite seats of these gummata in bones, are the tibia, the clavicle, sternum and ribs; while for soft structures, they generally prefer the skin, brain and liver.

There is a collection of bones at the Royal College of Surgeons thoroughly riddled and worm-eaten by syphilis.

It may be taken as a general rule, that one attack provides an immunity from another. But a second attack is not unknown.

Having thus traced very briefly the course of the disease in its acquired form, perhaps a few words on the principles of its *treatment* will not come amiss. Although it spreads its terrible ravages on all hands if left alone, yet when treated by two drugs (which can almost be said to be specifies for the disease, namely Mercury and Iodide of Potassium) it can almost be eradicated from the system.

The treatment is local and constitutional, but little reliance is put on the local, if the constitutional is not adopted. Hence I shall only give the general one.

Mercury may be given internally in the form of blue pill, or the preparation of hydrarg. cum creta, or with calomel.

Mr. Holmes thinks in the primary stage, three to five grains of blue pill combined with a quarter of a grain of opium should be given twice a day, and should be continued until five or seven weeks, by which time the sore should be gone.

In the secondary stage, mercury must be taken for a longer time. Covering any abraded surfaces with a powdered preparation of this drug, say Calomel, will generally cause them to disappear, and the mild ointment of Mercury may be used also.

Occasionally, Mercury is contra-indicated when the health of the patient is enfeebled, as in the case of scrofulous tuberculous patients, and those suffering from any form of Bright's disease, and in one's idiosyncracy; and then Iodide of Potassium should be used.

In the tertiary stage, the treatment consists chiefly of Potassium Iodide in doses of 10 to 20 grains, three times a day; but it is on record that Mr. Berkeley Hill gave as much as 120 grains. Also small doses of Mercury may be added.

There is one danger to be guarded against in the prolonged use of Mercury, and that is *Mercurial Ptyalism* or Salivation, in giving the symptoms of which, I make an extract from Mr. Stocken's invaluable "Dental Materia Medica." He says :—

"The first symptoms are slight tenderness and tumefaction of the gums, which acquire a pale rose colour, except at the edges surrounding the teeth, where they are a deep red. Gradually the mouth becomes very sore, and the tongue much swollen, coppery taste is perceived, the teeth are slightly loosened, and the breath acquires a remarkably fœtid odour; the salivary glands soon become tender and swollen, the saliva and mucous of the mouth flowing abundantly. In aggravated cases, the teeth fall out, and periostitis and necrosis ensue."

While on this subject of salivation, I hope I may be pardoned for making another small digression. It is to give a list of substances mentioned by Sir Thomas Watson occasionally producing ptyalism. Preparations of gold, copper, antimony and arsenic, also castor-oil, digitalis, iodide of potassium, and opium, croton oil given internally, and nitro-muriatic acid applied to the surface of the body, have also been mentioned as occasionally productive of similar results. I am indebted for this list to Tomes' Dental Surgery.

Thus far, Gentlemen, I have very briefly laid before you the general course of the disease; it now remains for me to draw your attention to the lesions which occur in the mouth.

The first I shall notice will be in connection with the *Tongue.* In the early part of the secondary stage, small papules may appear upon this organ. At the end of the first year small superficial ulcers on the side of the tongue may appear, and cause discomfort. These can be locally treated with perchloride of mercury. This will relieve the patient of the discomfort and pain, but as I have previously remarked, local treatment is of hardly any avail if unaccompanied by constitutional.

Sometimes a crack or small fissure may be noticed on one side surrounded by thickened epithelium.

At a later period the dorsum of the tongue becomes attacked, the epithelium becoming opaque, white and thickened.

In the tertiary stage a gumma is often formed in the muscular portion, which breaks down with a discharge of thin pus, and which sloughs away leaving the edges overhanging the cavity. These edges appear like little pieces of damp leather. Gummata usually yield to the Iodide of Potassium.

If, however, any sharp point of a tooth, or a ragged piece of a root be present, it should be filed smooth or be removed, as a syphilitic person is much more prone to get an ulcer at the point of friction than a healthy person is.

And, further, actual epitheliomata have been known to be derived from abraded surfaces.

The Lips are commonly affected with fissures or cracks sometimes indurated, and painful in the movements of these parts.

Chancre of the lip may result from drinking out of the same vessel, or using a spoon after a syphilised person has used it, or from smoking the same pipe.

The Chancre presents the same appearances as the primary Hunterian chancre, viz., hard base, foul surface and equally persistent character.

This, however, will disappear by the constitutional treatment of the disease.

Again, the *Oral Fluids* have been known to convey the virus of the syphilitic taint; thus we read in Tomes' Dental Surgery that "a sailor tattooed 22 people, wetting his needle with saliva, his mouth at the time being covered with sores; out of these no less than 15 acquired syphilis." But perhaps in this instance the infection lay not in the saliva but in the discharges from these sores. But if this is so, and if saliva does convey the virus, strict cleanliness again must be urged upon all of us in that our instruments must be scrupulously clean.

Syphilitic Stomatitis is another effect of the disease, and is rather indistinguishable from the ulcerative stomatitis, but the ulcers have not the extreme tenderness which is so commonly met with in the ordinary forms; such as the apthous, and ulcerative. Shallow ulcers form beneath the tongue, and mucous patches appear on the cheeks. Sometimes the inner surface of the upper lip may be affected, and closely simulate the ulcerative form by spreading on to the gum. These are also treated by the Iodide of Potassium.

Another still more grave effect of syphilis is the *Necrosis of Bone*. And here may I point out a very frequent cause of necrosis. And that is periostitis or inflammation of the periosteum of the bone, resulting in an effusion of pus between the bone and its periosteum. The pus when present in a large quantity will cut off the blood supply and thus cause death of the bone, either superficially or to a greater extent. Hence, in syphilitic necrosis, a node forms on a bone, and rapidly liquefies and separates the periosteum from the bone, and so necrosis ensues.

The soft spongy bones are the ones chiefly attacked, although cases are on record of the bones of the roof of the skull having been destroyed. The subcutaneous bones such as the tibia, clavicle and ribs are very liable to be necrosed as are also the alveolar margins of the upper and lower maxillæ and also the hard palate. Cases of necrosis of the jaws occasionally come before our notice, whether of syphilitic origin or not. I am afraid not much can be done for the patient, the general health must be kept up as much as possible and the sequestra should be removed when thoroughly loose—not else ; and the mouth be well washed with disinfectants.

So far, Mr. President and Gentlemen, I have touched upon some of the Acquired forms of the disease, and now I shall bring before your notice some of the characteristics of Congenital Syphilis.

Such patients, when children, are often small, wan and wasted, and have a peculiarly aged look, and also have what is popularly known as " snuffles," as there is a great difficulty in breathing owing to the congested state of the mucous membrane, which is attended with a secretion of thick yellow offensive mucous.

As they progress in age the marked symptoms of skin and mucous affections show themselves. The roseolar rash which we noticed in the secondary stage of the acquired class may appear, and is of short duration. Then appear the mucous tubercles, which form at the angles of the lips, in the mouth, in the nose, at the anus, and wherever the skin is moist, as in the groin and between the scrotum and thighs.

One more sign of congenital syphilis is the notched appearance of the superior central incisors, which characteristic was first pointed out by Mr. Jonathan Hutchinson; but, he also remarks that it is only after attacks of syphilitic stomatitis, that we are to expect the notched appearance ; Tomes, however, takes objection to this, and says "that it by no means follows necessarily that they are the direct result of attacks of stomatitis," and goes on to say "that the influence of inherited syphilis is capable of profoundly modifying the nutrition of the body, and it is quite as likely as that its effects would be brought about directly, as that they would be manifested secondarily through the influence of attacks of stomatitis

Coleman says he has seen these notched appearances without the slightest suspicion of syphilis being attached. Most probably the notch is formed by the regularly calcifying process being arrested, leaving the centre of the biting edge of the crown deficient in its normal amount of enamel.

Such teeth are of a dirty brownish colour, much smaller than usual, rounded and soft so that they soon wear down ; and they are also wedge-shape, being broader at the neck than at the cutting edge. Of course it is only the permanent teeth which are so characteristically affected in this way, the temporary ones being liable to a crumbling decay, and are often gone before their successors are ready to be erupted.

It has been said that an early recourse to mercurials will modify the effects of inherited syphilis and check any further manifestation of the disease ; thus I should think that the permanent incisors might be spared from their deformity by very early treatment ; as according to Magitôt, we find that at birth the cap of dentine has not appeared ; and as the dentine begins to calcify first, we find that there is a considerable time to treat the infantile patient in the hope of having normally well-shaped teeth.

I am not sure, gentlemen, whether this can be done: I shall be glad of your opinion. But in fairness to the physicians and surgeons of to-day, it is hardly to be supposed that their treatment of congenital syphilis has been imperfect, since the patients still possess the characteristic form of tooth.

Or is it rather, I should like to ask, that these patients presenting these notched teeth, were never subjected to a course of mercurial treatment in their younger days.

And now in these days when there is so much talk about Implantation and Transplantation of teeth, both here and elsewhere, we must not shut our eyes to the possible consequences of implanting a tooth, the life history of which will give us some suspicions that it has come from a syphilitic mouth : as Tomes mentions the fact of the fierce criticism passed upon Hunter, because it was said he had communicated syphilis by means of transplanting teeth.

I thank you, Gentlemen, for the attention with which you have listened to my paper, and trust that I have been successful in so arranging the facts as to render a good discussion possible.

PULPITIS.

Thymol.—Hartmann (*Deutsche Monatsschrift für Zahnheilkunde*) recommends the application of thymol in substance in acute pulpitis, after thoroughly cleansing the pulp. He says that the pain in the tooth disappears in a few minutes. He prefers thymol to arsenic paste for cauterization of the pulp.—*Crndensed Extracts.*

British Journal of Dental Science.

LONDON, OCT. 1st, 1892.

THE IMPORTANCE OF MASTICATION.

An able and interesting article, dealing with the question of schoolboys' meals has recently appeared in the *British Medical Journal*. In summing up the complaint that, in certain quarters, the feeding is ill-managed rather than that it is insufficient, attention is directed to the importance of the function of Mastication. "Thorough mastication of all food should be encouraged; regular periodical examinations of the teeth of all pupils should be carried out—an important matter still much neglected, but now beginning in some quarters to receive consideration." These remarks, we can, of course, fully endorse; but at the same time we welcome an expression of opinion which, coming from such a source, gives hope that an increasing number of medical practitioners will recognise the necessity of maintaining the functional integrity of the teeth. Whatever excuses may be made for mistakes in diagnosis where other and more hidden portions of the *primæ viæ* are concerned, it seems manifest that in disordered conditions, or at all events where failure in the function of Nutrition may appear to be the *fons et origo mali*, one of the first points to receive attention must be with regard to those organs which, situated at the very commencement of the alimentary tract, can be readily examined by the senses of vision and of touch. If this be the case in disease, it is evidently still less inexcusable to neglect the constant supervision of the dentition as a means of preventing a possible source of departure from health. It is well to bear in mind that the great Tripod of Life—Brain, Heart, Lungs—depends after all upon the proper functioning of the organs concerned in Nutrition. Holding these views we feel unable to fully appreciate the quotation made by our medical contemporary. That "an army fights upon its stomach" may be true enough, but the statement that an army depends upon its teeth, would hold good as much now as if it had been made when it was necessary to bite the ends of cartridges.

In the same way that people now recognise the beneficial results derived from improved sanitary science, with its personal inconveniences such as compulsory notification and other regulations for the general weal; or in the same way as other special branches of knowledge are becoming accepted and utilized by an enlightened and, we may hope, a grateful Public, so it may be anticipated that the demand for the services of carefully trained dentists will continually increase. Much good is done in this direction by the everyday professional work of such men, and the papers read and opinions expressed at Society and Association meetings, no doubt serve to enlighten our medical brethren upon such subjects as the causes of Caries, or the necessity of artificial dentures.

Other questions, however, arising out of a closer consideration of these facts when broadly applied, seem to complicate the possibility of arriving at anything like an absolute and unanimous expression of opinion as to the responsibilities of the Profession in its relation to the Public. Even supposing there becomes manifest a wide awakening as to the importance of thorough mastication in association with health, and granting that, to a large extent, this education has been brought about by a conscientious enthusiasm exhibited by some of the bolder spirits amongst dental practitioners, yet there remains an even more delicate consideration. How far is an honest dentist justified in standing aloof, and withholding an expression of opinion with regard to certain modes of so-called practice carried on with all the astuteness which a merely commercial instinct prompts?

Such ethical questions can on the present occasion be only alluded to ; but it is well that all honourable dentists, who take an interest in the well-being of their fellow-creatures and the future of their Profession, should revolve these things in their minds, and be prepared to discuss them with their fellows with that desirable equanimity which comes with, and results from, deliberate consideration.

TUMOURS OF THE TONGUE.—A new growth in this organ is always to be regarded with the gravest apprehension, but occasionally cases are recorded where an examination of the structure of the tumour leads to a hopeful prognosis, and warrants the diagnosis of a benign tumour. Two cases are described in the Epitome of the *British Medical Journal*, reported by Lang. Both of these occurred in females. A woman of 22 had a roundish hard tumour which in twelve years attained the size of a hazel nut, and was situated on the left side of the dorsum near the root. It was slightly raised above the surface, and had a broad base, but the mucous membrane was intact. It was removed under cocaine without much hæmorrhage, and was found to be a fibro-chondro-osteoma. In the second case, a girl aged 13, had a typical adenoma, of the size of a plum, growing from the root of the tongue, close to the epiglottis, and causing indistinct articulation with a nasal twang. The mucous membrane was traversed with dilated blood vessels, and showed patches of incipient sloughing and ulceration. The swelling had first been noticed three years previously. It was excised similarly under cocaine by the same surgeon. Sharp arterial hæmorrhage followed, which was controlled by tying a vessel (probably, either the dorsal or the right lingual artery). The wound healed in about seventeen days, the patient being discharged with a perfectly normal voice. The author has been able to find only one case of lingual osteofibroma (Zahn) and one of adenoma (Testut) recorded in medical literature, Successful Veterinary Prosecution.—A short time ago, we drew attention to the powers conferred by the Veterinary Surgeons Act with regard to illegal practice. Another case has recently occurred at Liverpool, where the Royal College of Veterinary Surgeons prosecuted a man for describing himself as qualified to practice, although he was unregistered. Evidence showed that the words "Veterinary Infirmary for Horses" appeared on a sign-board, and "Veterinary Infirmary" on a lamp. The magistrates considered the case proved, and fined the defendant, although he pleaded that he had not held himself out to be a veterinary surgeon. We hope such decisions may pave the way for a better and more satisfactory reading of a clause in the Dentists' Act. In Medical practice, similar difficulties occur; any person, qualified or not, may give advice without infringing the law, but he must not hold himself out as being qualified, although we notice cases where the magic letters M.B., placed after a name, are explained as indicating medical botanist, and not Bachelor of Medicine.

Fatal Case of Impacted Denture.—Another of these unfortunate cases has just been recorded in the public press, and would appear to furnish another instance of the danger attaching to some partial dentures. It too frequently happens that people neglect to have a case repaired, or necessary additions made, and they become accustomed to the mobility which results and which sometimes ends in such a disastrous manner. At the inquest at Guy's Hospital the other day on the body of Rhoda Cramp, a housekeeper, aged 44, it appeared that her master noticed one morning that she had a hacking cough and asked what was the matter. She replied that she had been in the habit of wearing an artificial tooth on a metal plate, but she had swallowed it late the previous evening, and it had been in her throat all night. A medical man sent her to the hospital, where, after an unsuccessful attempt to extract by the mouth, œsophagotomy was performed and the plate and tooth were removed. According to the medical evidence death resulted from blood-poisoning and abscess, and the jury returned a verdict of "Death from Misadventure."

"AMERICAN" DENTISTRY IN PARIS.—The *Figaro* gives an account of two cases reported from Paris in which some heavy fees were obtained by a self-styled-specialist. In the first instance a wealthy American lady was charged £96, but the work not proving satisfactory, she demanded her money back with the exception of 400 francs. As the dentist refused to refund it he was charged at tho Police Court with swindling. The *Figaro* does not record the result, but it would appear that he charged £5 per hour for his time. The bill of another American customer of the same gentleman was still more outrageous. She had one tooth fixed, and these were the items charged in her account—

	fr.	c.
To 1 Porcelain crown	120	
To 1 Gold filling the same	105	
To 1 Tooth covered in porcelain ...	85	
To cleaning and polishing set of teeth ...	20	
To Painless extraction of tooth, nerve, and pulp, and ten and a half hours' work at 125fr. per hour	1,312	50
	1,642	50

£65 for one tooth! We can only offer our sympathy to genuine American dentists, who must feel that the special designation will soon become unadvisable in the face of what so frequently passes as representing special methods.

Forcible Feeding.—An author on the Continent reports the effects of employing "gavage" in the case of seven infants where it was necessary to resort to artificial feeding. In most of these cases, the children resume voluntary feeding after the employment of "gavage" for a short time, and although it is difficult to predicate for them much common sense at so early an age, it would almost seem as if they were able to recognise the advantage of taking their nourishment in a normal manner. We are told that when an infant is totally, or even partially, unable to take food, the physician must not be deterred by fears of foreign substances passing into the larynx, but should employ gavage. A soft catheter, helped by the fore-finger, is quickly passed over the epiglottis, and closed by pressing against the child's mouth. The catheter is connected by a rubber tube, with a glass funnel, into which the food is poured. When pressure on the tube is removed, food flows into the stomach, and the catheter is quickly withdrawn. The child should afterwards be held as still as possible, in a sitting posture, in order to avoid vomiting.

Prevention of Cholera by Inoculation.—M. Haffkine, of the Pasteur Institute in Paris, has obtained a fixed virus by cultivating the cholera bacillus through a series of transmissions. When animals were inoculated, first with an attenuated, and then with an intensified form of the virus, they resisted the attack of the cholera microbe to which the Paris cases for the last five months have been due. M. Haffkine then similarly inoculated himself, and, later on‘ several of his friends ; whilst the official operator at the Institute has inoculated thirty-two persons. Of course, the experiment has not been completed, as in the case of the animals, by administering a dose of cholera germs. A lady correspondent has, however, written to the *Lancet* offering herself as a voluntary subject for the required test. It is needless to say the Journal in question refuses to be a party to such an experiment.

"OUR DUTY TO OUR PATIENTS." Under this heading, a correspondent writes to the *Lancet* with regard to the effects produced upon the teeth through the administration of certain drugs. He had read an article entitled : "The Hygiene of the Teeth," and, in his letter, makes some very pertinent remarks to the effect, that whilst looking after the rest of the body, it is one's duty not to damage so important an organ as a tooth. It is pointed out, that whilst great stress is frequently laid on the functions of the rectum and the colon, much discomfort might be saved were due attention given to the care and cleanliness of the teeth, and the proper mastication of food. The correspondent presumes it might be thought bad taste to supply patients with a few printed simple rules, but suggests that amongst the poor, and in unopposed practices, great good would result, and no harm could be done, by the distribution of a leaflet to one's own patients. The letter has a bearing upon, and confirms, some of the opinions expressed in our leading Editorial.

FRACTURE OF THE MAXILLARY AND MALAR BONES.

Gayet, in the April number of the *Arch. d'Ophthal.*, relates a most interesting case in which fracture of the maxillary bone and of the malar bone of the left side produced displacement, not only of the fragments of bone, but also of the skin and soft tissue, causing an unsightly deformity. This was, in Gayet's opinion, more than could be rectified by mere freeing of skin and tissue, so he made a large flap of the soft tissues and removed the periosteum, separated the depressed bone with a dental drill and elevated it. The piece of bone containing part of the orbital margin, when in proper situation as regards the orbit, was not by its inferior edge in proximity with the maxillary bone ; this was corrected by the insertion of platinum clasps, which held the separated part in its proper position as regards the orbital margin.

Glasgow Medical Journal.

Abstracts of British & Foreign Journals.

CONCERNING COMBINED FILLINGS.

By W. D. Miller, M.D., D.D.S., Berlin.

Most practitioners of dentistry will readily endorse the statement that of the many materials used for filling teeth there is not one that does not fall far short of fulfilling the requirements of what might be styled the perfect or ideal filling material. It is equally indisputable that the advantages or disadvantages of the various materials manifest themselves in various degrees in different classes of cavities, as well as often in different parts of one and the same cavity. For instance, in compound cavities gutta-percha serves its purpose excellently at the neck of the tooth, decreasing in efficiency rapidly as it is carried toward the grinding-surface; while the cements, which may occasionally serve a good purpose at the grinding-surface, generally become worthless as we approach the neck of the tooth. These well-recognized facts not only suggest the idea of an eclectic practice, but have already given rise to the employment of various combinations of two or more materials for filling one and the same cavity. Furthermore, experiments in the laboratory, as well as experience in practice, have established the fact that for certain cases two materials thoroughly combined or mixed together, *before introducing into the cavity*, may give a much better result than either of the ingredients used alone. We accordingly recognize two classes or categories of combined fillings,—those in which different parts of the same cavity are filled with different materials, and those in which the materials are so mixed that the filling has the same character throughout. The former might be designated as jointed fillings, the later as mixed fillings.

Attention is called to some of the methods of combining different filling materials which have been recommended, and in part have stood the test of practical application. The results thus far obtained have been sufficiently encouraging to merit more attention than has as yet been bestowed upon them. Of the eighteen to twenty different combinations reported upon, some are only mentioned for the purpose of obtaining a general survey of the subject; others are discussed more at length as their importance may seem to demand.

1.—Combinations in which a Layer of One Substance is introduced between the Bottom of the Cavity and the Filling Proper, as a Protection to the Pulp.—Recent communications upon this subject have added nothing new either in regard to materials or methods of manipulation, unless we except the experiments of Gilmer on the conductivity of different materials, used in filling teeth. A completely reliable study of the comparative conductivity of different materials, as that of Gilmer appears to be, would often be of great service in determining what material should be used in filling teeth abnormally sensitive to changes of temperature.

2.—Joint fillings of Non-cohesive and Cohesive Gold.—Many dentists still endorse the practice of combining non-cohesive and cohesive foils, with a view to utilizing the particular advantages claimed for each preparation in the same cavity. In large approximal cavities a pledget of non-cohesive gold is placed upon the cervical wall and followed up by cohesive gold; or in case of the front teeth, the cervical and lingual walls may be covered with non-cohesive gold; or, finally, all the walls of the cavity may be lined with it and only the central portion of filling made of cohesive gold, which serves as a key to bind the whole together. The reasons given for this practice have been frequently pointed out, and must be familiar to everyone. From his own experience and observation the author can only endorse the procedure, though in his practice tin-gold has largely taken the place of non-cohesive gold in such operations. The theoretical objection to this method, that the undercut becomes filled up with non-cohesive gold, and that the cohesive gold does not have sufficient anchorage, he has not found to be an objection in practice. On the other hand, in saucer-shaped cavities where it is difficult to adapt cohesive gold, he has occasionally overcome the difficulty by making the bulk of the filling with non-cohesive and finishing with cohesive foil.

3.—Joint fillings of Tin and Gold.—Spooner is reported to have used tin in combination with gold as much as fifty to sixty years ago, and in recent years it has been used quite extensively in pretty much the same manner described under 2. A very thin layer of tin at the cervical margin was thought to adapt itself somewhat better than gold alone, and also, "in consequence of the oxidation of the tin," to produce a filling perfectly water-tight at the neck of the tooth, a condition which can be claimed for but a small proportion of cohesive gold fillings in practice. The two materials unite in a short time, so that the objection to the combination of cohesive and non-cohesive gold mentioned above does not hold here. Dr. Millar has no experience in this manner of using tin, though he is in almost constant use of tin-gold for the same purpose (as describe dunder 5), and with most satisfactory results.

4.—Mixed Fillings of Tin and Gold. A thorough discussion of this combination would require more space for itself than for all the seventeen combinations considered in this article. The subject has, moreover, been repeatedly brought before the profession in late years, so that there is at present no particular call for an extended presentation of it. On the whole it has met with considerable adverse criticism, chiefly from those who have tried it but little or, often, not at all, and whose opinions therefore are naturally entitled to less consideration than those of practitioners who have given the material a fair trial. Some of the remarks concerning tin-gold do not seem to the author to quite come up to the standard set for unbiassed scientific criticism. For example, Hungerford is credited with the statement that non-adepts in the use of gold are the ones who favour the combination. Any one inclined to make use of the same style of argument could only reply, "Then why doesn't H—— favour it?" There is, of course, nothing to be gained by this mode of discussion. Besides, if the combination of tin and gold fulfilled only a need of the the non-adept, what a blessing it would be to the profession and the community! As a matter of fact, however, there is not a man in the dental profession who is so proficient in the use of gold that he can afford to ignore materials which may not require for their successful manipulation quite as high a degree of skill as is required by gold. Finally, it is not difficult to find cases in which it requires much more skill to make a good filling of tin-gold or of non-cohesive gold than it does to pile up mountains of cohesive foil. The position taken by Ottolengui appears to be also contrary to the experience of the great majority of the dental profession, when he argues that there is no need of new filling-materials. Repeatedly we are confronted by cases where we are obliged to ask ourselves, not the question, Which is the perfect filling-material for this cavity? but, Which has the fewest objectionable qualities? The old song that failure of gold at the gingival margin is due to faulty manipulation does very well, but failure at the gingival margin continues to occur and will continue to occur, even in the hands of the most skilful and and conscientious dentists, to say nothing of the dentist of average skill who makes up the great bulk of the dental profession. All honour to gold, although it is far from being a perfect filling-material; but at the same time let us not attempt to discredit other materials, particularly when they have stood the test of over a quarter of a century, without having tested them with the same skill and patience and conscientiousness which we are called upon to cultivate in the use of gold. Having used both gold, and tin and gold, for fifteen years, Dr. Miller meets almost daily with cavities which he can fill better and with far more ease, with tin-gold than with gold alone: and as there is no reason to suppose that he is different in this respect from *everybody* else, the inference is justified that others who would give the material a fair trial might find the same. Besides, this is the testimony of a great many practitioners who have become thoroughly acquainted with the materials. Naturally the manipulation of tin and gold is not learned in a day. The material must be inserted with care, and particularly those who have never learned the use of non-cohesive materials would probably encounter some difficulty. A badly condensed tin-gold filling will become brittle, sometimes powdery; a properly condensed one never. I may mention in this connection also that the rolls of tin-gold should never be made with sweaty or moist fingers, or be allowed to lie in a damp place before using. They may in such case become stiff and difficult to manipulate.

5.—Joint Fillings of Tin-Gold and Gold.—This is a combination in which tin is extensively used in connection with gold by the advocates of tin-gold as a filling-material. Large, cavities of almost every character, particularly, however, compound approximal cavities, are filled one-third to two-thirds with tin-gold, and the operation completed with cohesive foil. It has a very decided advantage over amalgam used in this way, in that the gold unites perfectly with the tin-gold to form a solid filling. The operation may also be completed in one sitting, and the tin-gold has better preserving properties than amalgam.

6.—Joint Fillings of Non-cohesive Gold followed by Tin-

Gold.—A class of cavities which requires to be treated with great care is formed by approximal cavities in frail incisors and cuspids, in which the lingual wall is partly or completely destroyed. For those who use non-cohesive gold in such cases the operation may be lightened by covering the labial wall with non-cohesive gold and filling the cavity one-half to two-thirds full with it, finishing with tin-gold. In making these fillings with non-cohesive foil, most operators will agree that by far the most difficult part is the insertion of the last few pellets on the lingual wall, where we have not been able to obtain an undercut. One or two trials will convince anyone how much more readily this part of the operation may be performed with tin-gold. Of course, a filling of this kind has a gray colour upon the lingual surface ; from the front, if seen at all, it appears as a gold filling.

7.—Joint Fillings of Amalgam or Cement over Gold.—This combination applies only to those cases where a thin layer of gold is placed against a thin wall of enamel to prevent the cement or amalgam from showing through. If the surface of the wall is first given a thin coat of varnish, the gold will adhere to it and keep in place while it is being fixed with the cement or amalgam. Where amalgam is used, Morrison recommends gilded platinum, since it does not become amalgamated by the mercury.

8.—Joint Fillings of Amalgam and Gold.—The practice of filling very large and difficult cavities one-third to two-thirds full with amalgam, and covering this with gold, has been carried out to a considerable extent, but reports as to the manner in which such fillings have stood the test of time are still wanting. Their chief advantage over all-amalgam fillings is their appearance, and the better preservation of the teeth at the grinding-surface ; their chief advantage over all-gold fillings is their ease of insertion, and, probably, in difficult cases, the better preservation of the tooth at the neck. One of its great disadvantages, which it possesses in common with many other joint fillings, lies in the fact that the two parts of the filling do not unite with each other. It is often also a serious drawback that the operation requires two sittings for its completion.

The author considers the combination discussed under 5 preferable for most cases, since it gives a better adaptation of the filling at the neck of the tooth ; both parts of the filling unite firmly together, and the operation may be completed in one sitting. He has occasionally used the amalgam and gold to advantage in distal cavities in the molars, in cavities involving the distal and buccal surfaces of bicuspids, filling the distal portion with amalgam and the buccal with gold. A method of making amalgam-gold fillings in one sitting was described by Clapp, and should be referred to in this connection. The principal features in Clapp's process are: (1) The preparation of the cavity with square edges in the portion to be occupied by amalgam; (2) the adjustment of a perfectly fitting matrix; (3) the thorough condensation of the amalgam, which should be mixed dry; (4) the use of Steurer's platics gold for beginning the gold portion of the filling. The first pieces are swallowed up, so to speak, by the amalgam, "but by persevering the gold will soon assert itself and overpower the amalgam." The filling may then be completed with any cohesive gold. The greatest care is necessary in every step of the operation. The meagre reports which have appeared concerning the success of the Clapp operation in practice have been very favourable, and the article by Clapp should be referred to by all who are not converts to the pernicious doctrine that any tooth that is worth filling at all is worth filling with gold.

9.—Copper Amalgam and Alloy Amalgam.—In order to take advantage of the saving properties of copper amalgam at the cervical wall, and at the same time avoid the discolouration of the tooth resulting from this material, as well as its tendency to wear away at the grinding-surface, it has been recommended to combine it with alloy amalgam.

W. H. Trueman is reported to have stated that copper amalgam, while not discolouring the teeth when used alone, does have a tendency to do so when combined with gold or an alloy amalgam. He furthermore states that if the two amalgams are inserted at the same time, the alloy amalgam will not harden. Whitney, on the other hand, states that he is in the almost daily habit of covering copper amalgam with platinum and silver alloys, with the best results as far as hardening and appearance are concerned. Likewise Russel writes, "Some alloys will join very readily, as I have proved by filling one-half of a glass tube with alloy and the remainder with copper amalgam. When hard the tube was broken, and it was impossible to break them apart at the joint."

10.—Cement or Amalgam over Gutta-percha.—Gutta-percha is one of the best materials at our command in places not exposed to the action of mastication. It therefore performs good service at the cervical wall in approximal or compound approximal cavities ; cement, on the other hand, is altogether unreliable at the cervical wall, but holds *comparatively* well on the grinding surface. The combination of the two materials consequently often gives a filling somewhat better than gutta-percha alone, and far better than cement alone. For the last ten years Dr. Miller has very rarely made filling of phosphate cement in cavities extending under tha gum without protecting the neck of the tooth with guttae percha, extending a thin layer of this material over the bottom of the cavity as a protection to the pulp where it is nearly exposed. These fillings are, however, in one respect, far from satisfactory. The cement not only wears away rapidly, but also disintegrates at the joint with the gutta-percha, so that the food wedges in between the teeth and accumulates at the point, rendering it very difficult to keep the place clean. Notwithstanding this shirking of duty on the part of the cement, the intrinsic saving capacity of the gutta-percha protects the tooth from secondary decay. The result will be somewhat better when the gutta-percha is built up square, though in this case it does not afford the protection to the pulp. In like manner amalgam may be used as a capping for gutta-percha, and where the walls of the cavity are sufficiently strong, it gives a decidedly better result than cement. In both cases a hard variety of gutta-percha should be used.

11.—Gutta-percha or Cement protected by a Thin Gold Plate.—This combination was occasionally used formerly in large cavities on the grinding-surface. The plate, cut to fit the opening of the cavity as accurately as possible, has one or two short pins soldered to it at right angles to the surface, and is simply pressed upon the cement while yet soft, being retained by the pins as well as by the adhesion to the surface of the plate, which should be roughened. In case of gutta-percha fillings, the plate, of course, may be warmed before pressing into place.

12.—Amalgam retained by Cement.—On account of the tendency of amalgam fillings (manifested, it is true, to very different degrees in different preparations) to contractor draw away from the walls after insertion, retaining points or undercuts, are imperative in all cavities which do not otherwise have a retaining form. Cases are, however, constantly occuring in which it would be of the greatest benefit, for reasons well known to every practitioner, if the necessity of making retaining points or undercuts could be avoided. For such cases it has been recommended, and to some extent practiced, to cover the bottom of the cavity with phosphate cement and to pack the amalgam immediately over it while the cement is still soft. The cement should be of a variety which possesses the greatest adhesive properties (they vary much in this respect), and should be mixed rather thin. It is well to press or prick the first portion of amalgam into the cement with a deeply serrated instrument. Experience with this method has been limited as yet, but there is no question that it is worthy of trial. A few experiments made out of the mouth, will soon convince one that the amalgam firmly adheres to the cement,

13.—Gold retained by Cement.—In a manner similar to that just described, cement may serve to retain or help to retain gold fillings in shallow cavities. The bottom of the cavity is covered with cement in a soft condition, one or more pellets or pledges of cohesive gold pressed into it, care being taken that the upper surface of the gold does not become in any way contaminated by the cement. As soon as the latter is thoroughly hardened, the operation of building on the gold may be proceeded with. Naturally a very adhesive, quick-setting cement is desirable.

A somewhat different method of obtaining the same result has been recommended by Oltramare.

He uses a gold cake, prepared out of the mouth, which he presses upon the cement already partially hardened, at the same time warming the gold by means of a heated burnisher or by blasts of warm air. The cake is easily pressed into the cement, which has been resoftened by the heat, and adheres firmly, while the cement quickly sets again and permits the operation to be proceeded with almost immediately.

Oltramare prepares the gold cake by condensing a number of gold cylinders or pellets upon the surface of a serrated steel plate, holding the gold with one instrument and condensing it with another. The cake must be adapted to the cavity in size and form, and being serrated on the under side it adheres very firmly to the cement if properly adjusted. Experiments out of the mouth give very promising results.

14.—The Combination of Amalgam and Cement has in late years received considerable attention both in Europe and America. The cement should be of an adhesive variety, and must be thoroughly incorporated with the amalgam, while the amalgam must be of the best quality and contain enough mercury to effect a complete amalgamation. Incorporated in a powdery condition, it may do more harm than good. It is claimed that the combination does not contract on setting, and experience seems to confirm the claim. It appears to withstand both mechanical and chemical action much better than cement, and is a poorer conductor than amalgam ; it is as easily inserted as cement, and is nearly as adhesive. It certainly deserves a trial. It may be varied almost at will, since it depends upon the colour of the cement used and the proportion and quality of the amalgam, as well as upon the particular preparation of amalgam used.

In a case of extensive erosion of all the front teeth, where the patient would not think of having gold, and cement had proved almost useless, the author obtained results with cement and amalgam with which both the patient and himself were better pleased as to appearance than with cement, and which have already outlasted two cement fillings, and still show but little sign of wear. In this case, however, the teeth were considerably darker than the average.

He has occasionally also found cement-amalgam very convenient for setting pivot teeth in forlorn cases, and says that it has worked far better than cement alone. It would be excellent for setting Logan crowns.

15.—Combination of Gutta-percha with Alloy Fillings, Tin, etc.—Repeated attempts have been made to increase the hardness and resistance of gutta-percha by incorporating various inorganic substances into it. The world-renowned Hill's stopping is one of the results of these attempts. More recently it has been sought to attain the same end by softening the surface of the gutta-percha filling with chloroform (Butler), or with eucalyptol, or by heat, and then working fillings of alloy into the superficial layers (Line). Finally, the softened gutta-percha has been kneaded together with metal filings before introducing it into the cavity, so that not only the outer layers but the whole filling was permeated with the filings. Up to the present, however, no particular advantage seems to have been gained by these experiments. Line recommends a new method of combining tin with gutta-percha in which the filling is so made as to consist of alternate layers of gutta-percha and tin, so placed that the layers are parallel with the direction of the force in mastication. Fillings so made are observed to wear away much more slowly than gutta-percha fillings.

16.—Combinations of Cement with Alloy Filings or with Pulverized Porcelain.—Parker recommends very highly "zinc-phosphate and alloy filings mixed and prepared for filling as ordinary phosphate." Having used it for five years, he finds it far superior to any cement. He uses an alloy of silver, tin, and a little platinum. Alloys containing much zinc or copper should not be used. The cement should be the dento-plastique of The S. S. White Company, or something like it. "It has the qualities of any cement; secondly, it always presents a metallic surface, so that it is worn down very slowly by mastication; thirdly, as to conductivity it is better than either of the strictly metallic or cement preparations." Howe likewise speaks well of the mixture.

Perry has occasionally used pulverized artificial teeth mixed with the phosphate, sometimes with astonishingly good results, sometimes not. I have tested the method a few times, but was not sufficiently encouraged by the results to continue the experiments.

17.—Combination of Glass or Porcelain with Amalgam or Gold.—Cases are frequently to be met with in which caries, beginning on the approximal surface of the upper incisors or cuspids, has destroyed a portion of the labial wall. Fillings of gold are naturally more or less conspicuous; cement is not much better, besides being very impermanent; porcelain or glass fillings cannot be inserted for want of space. For these cases Dall, of Glasgow, recommended to fill the lingual or approximal portion of such cavities with gold or amalgam, then to properly shape the labial or visible portion and insert a porcelain filling.

Dr. Miller restored a crown with amalgam, and when it had set, on the following day, prepared in that part of the filling which was visible from the front a box-shaped cavity with rounded corners, took an impression with No. 30 platinum gold, melted a glass filling, and set it in with phosphate cement. No one, except perhaps a dentist, conversing with the lady, would suspect that the tooth was not perfectly sound. The operation was performed only five months ago, so that not much can as yet be said as to its durability.

Besides the combinations already referred to, various others have been proposed or recommended, such as inlays of vulcanized rubber, combinations of Robinson's fibrous foil with gold, using mercury to establish the union between the two. Furthermore, the use of two metals in combination for root-fillings, in order to bring about an antiseptic action through the electric currents thus established, or, what seems to me to be of still more doubtful utility, the use of a wire of combination metal of tin, silver, and gold in the treatment of pulpless teeth to obtain an *electric stimulus.*

The Dental Cosmos.

SOME POINTS IN PHARMACOLOGY AND MODERN THERAPEUTICS.

By J. O. Brookhouse, M.D.

Medicine, using that term in its largest and broadest significance, is at once an art and a science, and is based upon observation, experiment, and practice. As a science, it must necessarily be inexact, for it deals with the highest organism —that of man—under conditions the most uncertain, unstable, and complex. Hence the apparent fallacies in experiment, the errors in observation, and the slow and uncertain advance in practice. Yet not perhaps in equal degree are these difficulties to be met with, for in purely and simply experimental research and laboratory work, some at least of the ordinary sources of fallacy may be controlled or eliminated, and thus more definite and correct conclusions be arrived at. To few, however, are such opportunities afforded, and with the rank and file of the profession rests not merely the recognition of disease and its treatment, but to no inconsiderable extent the advance of medicine in its practical issues ; for although it is true science has done much, and promises in the near future, with an army of able, devoted, and enthusiastic workers, to do more, yet it is probable that practical medicine will long be more indebted to a rational empiricism than to scientific inquiry. Science has given us much, if in some instances it may have led to error, yet this need not humiliate us, for in every field of experimental work error exists, and truth is only revealed by long and patient watching.

If, however, it cannot be claimed that experimentally very large additions have in recent years been made to our powers of cure, in two directions at least there have been originated methods of procedure which have already added somewhat to these powers, and which are of great promise for the future. Most of our present remedies are the outcome of experiments made on natural products, animal, vegetable, or mineral, or on compounds which the chemist has put at our disposal in his efforts to penetrate those secrets of nature with which he is specially concerned. For the chemist has not only separated the active principles from vegetable and animal substances, but has produced hundreds of new compounds, both organic and inorganic, some of which have been found of the greatest value as curative agents, for example, bromide of potassium, chloroform, nitrite of amyl.

It has long been known, however, that the action of even the simpler of these substances is the resultant of the properties of the atoms or groups of atoms of which they are composed ; that, for example, the atom of bromide and the atom of potassium in bromide of potassium, has each a special physiological influence on certain tissues and organs. These atoms when united, produce the physiological results of the molecule of the bromide, but the physiological action of the atoms can usually be traced in the various combinations they are capable of forming.

Chemistry has taught us that the various organic groups may be combined in an almost infinite variety of ways, and that it is possible thus to produce thousands of new bodies, each of which will have a special action on the tissues and organs according to the groups of which they are composed, and the method by which the groups are united. Of late, the chemist and the pharmacologist, working together, have built up for medicinal use a large number of these new compounds, joining together organic groups for definite purposes. In some cases where a group has been found to possess both good and bad properties, a second group has been combined with it to antagonise the detrimental quality, as for example in chloralamide, where the group NH_2 has been introduced to stimulate the medulla and thus antagonise the depressing influence of chloral itself on the heart and respiration, leaving thus its sleeping properties unimpaired.

In other cases, two groups of atoms possessing active properties have been combined to form a single substance possessing the properties of both, such for example is euphorin (phenyl urethane), where an antipyretic has been joined to a sedative group. In another new remedy, phenocol, the group NH_2, which stimulates the medullary centre, has been introduced into the antipyretic group of atoms known as phenacetin.

At least a score of new substances have been introduced during the past twelve months, for the purpose of fulfilling some definite therapeutic want, and though doubtless many, probably the majority, will not be of practical service, still there is evidence that some may prove to be very useful medicinal agents, and there is great hope that with increasing knowledge, new compounds will be formed, which will be of incalculable value in the treatment of disease.

The second therapeutic departure is, for the most part, one of promise only, namely, in connection with the use of the products of the lower forms of life which are connected with disease, or, again, of the use even of microbes themselves as therapeutic agents. It has been found possible in the lower animals to prevent the fatal termination which usually occurs when certain of these infectious diseases are artificially produced by the injection of micro-organisms connected with other infectious diseases, or in some cases of a toxic substance produced by these organisms. It has been shown, further, that animals, by the injection of certain micro-organisms or their products, may be rendered insusceptible to the evil influence of other infective bodies, which would certainly destroy them were it not for such previous injection, and, moreover, that the injection of the blood serum of an animal which is naturally insusceptible to certain infectious poisons into an animal which is susceptible will in some cases prevent the lethal effects of micro-organisms or their toxines when these are introduced into the tissues of the susceptible animal.

The methods by which immunity is produced and the cure of infective diseases brought about by the injection of micro-organisms and their toxic products has been recently discussed in the Pathological Society, and the question whether the experiments made on the lower animals will enable us eventually to deal effectively with infectious diseases in man, is one of great interest and importance.

The first practical outcome of the treatment of tubercle by the toxic substance produced by its bacillus, has doubtless so far produced a failure in practice, but in other directions successes have been claimed which may prove to be real. The injection of the blood of animals, such as the goat and the dog, immune, or almost so, to the tubercle bacillus, has been said by some to produce a beneficial effect in phthisis, and there are several cases recorded in which recovery from tetanus has followed the injection of antitoxin, a substance obtained from the blood of dogs artificially rendered refractory to the infective organisms of tetanus.

It is quite possible that some methods of treatment, founded on the knowledge which has been gained by the influence of micro-organisms and toxins, may not prove capable of practical application; if, however, this be the case, certain facts as to this influence are proved, and we have good grounds for hoping that further experiments made on the use of micro-organisms and their products will before long put in our hands new therapeutic agencies for the cure of infectious diseases in man.

British Medical Journal.

CHILDREN'S TEETH.

The statistics brought forward by Messrs. David Fisher and George Cunningham (who have so long been identified with the "cause" of children's teeth), aud which have repeatedly been the subject of papers read at the British Dental Association and other societies, are further supplemented by a report by Mr. Denison Pedley. This report is derived from from a systematic examination of 1985 children at the Sutton district schools. Though not so black as some, yet it shows an enormous amount of disease, for out of this number only 527 are recorded as having sound dentition. Mr. Pedley makes some pertinent remarks. The temporary teeth, he says, are popularly thought not to be deserving of any particular attention, whereas much misery and detriment to health may be avoided by judicious treatment. Between the ages of six and twelve there were, according to the table, 758 permanent teeth that could and should have been saved, 201 hopeless and 121 which had already been extracted, most of these being the six-year-old molar, a tooth so often mistaken by parents for one of the temporary set. He suggests that all public schools should have a paid dental surgeon, who should periodically examine all the children and perform any operations—conservative or radical—that are considered to be desirable, and, moreover, that a record should be kept. These views are entirely in accordance with our own, and, we are glad to say, are gaining ground generally, as exemplified by the recent sanction of the Local Government Board to the appointment of a dental surgeon to the Central London district. The records of so large a number of cases as would come under observation in such an appointment, if carefully kept, could not fail to be of scientific value.—*The Lancet.*

Dental News.

THE WORLD'S COLUMBIAN EXPOSITION.

We have received the following for publication:—

The World's Congress Auxillary.—Department of Medicine. General Division of Dental and Oral Surgery.—Preliminary Address of the Committee on a Dental Congress.

It is the aim of the World's Columbian Exposition to gather together the evidences of the material progress and achievement of the civilization of the world, and so arrrange them that every department of human endeavour may be studied and examined through all its various grades of development.

It is also their desire to represent the intellectual and scientific development and achievement of the entire civilized world by a series of great Congresses, to be held during the progress of the Exposition.

In pursuance of this object the World's Congress Auxiliary was organised by the World's Columbian Exposition, and it has received the recognition and support of the government of the United States.

It is the plan of the World's Congress Auxillary to bring into communication, through these Congresses, the best thinkers and workers in every department of knowledge, including Religion, Science, Philosophy, Literature, Art, Agriculture, Trade and Labour, etc., and by the presentation and interchange of ideas, methods, theories and practical experiences to promote the advancement of all that is noblest and best of our present civilization.

Committees have therefore been appointed to organize a series of Congresses, representing nearly every field of thought and of speculative and practical endeavour.

In the field of professional achievement, Medicine and Surgery, in their various special applications, will form a very large and interesting feature of the work of the World's Congress Auxiliary.

Dentistry is an important department of Medical Science, and an outgrowth of our modern civilization. Its present perfection is in considerable degree due to the thought and labour of American minds.

The history of modern dentistry is covered by a period of less than two generations, and yet it has advanced from the rude operations practiced by the blacksmiths and barbers, to one of the most scientific and exact of the specialties of the healing art.

Scientific Dentistry had its birth in the United States of America. This country has the proud distinction of having organized the first school for the teaching of dental science, and the establishment of the first periodical journal devoted to the interests of dentistry, while very many of the most useful appliances and scientific methods have originated on this side of the Atlantic.

It is therefore eminently fitting that Dentistry be represented at the World's Columbian Exposition by a display of the progress which has been made in the development of its materials, instruments, appliances, processes and methods of a practical nature, and in scientific research, literature and professional education.

With this end in view the dentists of the United States took steps in August, 1890, to organize such a World's Congress, by the appointment of a General Executive Committee, to whom the whole matter of organizing and conducting the Congress was referred.

The work therefore of the Committee on Dental Congresses appointed by the World's Congress Auxiliary will be chiefly in coöperation with that General Executive Committee, in publishing to the world from time to time the progress of the work of organization, in promoting the interests of the Congress in every way within their power, and keeping it in harmony with the general plans of the World's Congress Auxiliary.

Every effort will be made to secure the best talent in the presentation of scientific subjects, and in practical demonstrations.

The World's Columbian Exposition, through its Directory, will provide ample accomodations for all the various World's Congresses to be held in Chicago in 1893. The Memorial Art Palace now in process of erection upon the shore of Lake Michigan, and located near the centre of the city, will be devoted to this purpose. This building will contain two large audience rooms, with a seating capacity of about three thousand each, which will be used for the general Congresses of the various departments, besides numerous smaller rooms, suitable for the Chapters and Sections of the Congresses, thus affording for the Dental Congress ample accommodations for clinical demonstrations of a suitable nature.

During the sessions of the Dental Congress several popular evening meetings will be held, to which the general public will be invited. At these meetings, which are intended to be educational, illustrated lectures will be delivered by some of the most eminent men of the profession upon topics which are deemed to be of vital importance to the public. These meetings will be especially under the control and management of the World's Congress Auxiliary. When the suggestions of the Advisory Councillors of the Dental Congress shall have been received as to the most interesting and vital questions to be presented, a programme will be arranged for publication.

A cordial invitation is extended to the dentists of the world to take part in the scientific work of the Congress by the presentation of papers and discussions, or demonstrations of new or improved methods and appliances.

America, and Chicago in particular, will have a hearty welcome for all who may come.

An earnest effort was made to bring the meeting of this Congress in close connection with others of the Department of Medicine, but that effort having proved unavailing, arrangements have been effected under which the meeting of the dental profession will be held on or near August 17th, and is expected to continue during the week or ten days following. Definite dates and details will be given in the programme.

Communications in reference to the special work of the Congress should be addressed to Dr. A. O. Hunt, Secretary World's Columbian Dental Congress, Iowa City, Iowa, U.S.A.

Communications in reference to the general work of the World's Congress Auxillary and suggestions from the Advisory Councillors may be addressed to the Chairman of the Committee.

Dr. John S. Marshall, *Chairman*. No. 34, Washington Street, Chicago.

Dr. A. W. Harlan, *Vice-Chairman*.

Dr. G. V. Black, Dr. C. N. Johnson, Dr. George H. Cushing, Dr. N. Nelson, Dr. A. E. Baldwin, Dr. A. W. Freeman, Dr. E. S. Talbot, Dr. George A. Christman. Committee of the World's Auxillary on a Dental Congress.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

THE EARLY EXTRACTION OF THE SIXTH-YEAR MOLAR.

To the Editor of the "British Journal of Dental Science."

Sir,—Mr. Conner's article on "Some of the results of the early extraction of the sixth year molar," an abstract of which appeared in the *British Journal of Dental Science*, for September 1st, is of an amusing character, and his bringing forward a mode of treatment which no one carries out, for the ake of condemning it, reminds one of the cocoanuts at a fair, which are put up on a stick for the purpose of being knocked off again. It contains a fearful condemnation of the dentist who might extract a first permanent molar, no matter what agony the patient might be suffering, or what the state of the tooth or mouth, any time before 15 or 16 years of age, presumably, the result being "depression at the *alæ nasi*, and absorption of the facial surface of the superior maxilla," not to mention other contengencies, such as severe elongation ef the os coccyx and the external ears.

According to our old-fashioned ideas of anatomy, the canines are supposed to considerably precede the eruption of the second molars. According to Mr. Conner, the reverse is the case by two years. We can pass on, however, from this to the theory he claims to explode, viz., the advancing of the second molar if the first is extracted (second dentition). I hope I shall not appear rude, if here I flatly contradict him, when I say that what he calls a mistaken theory, is an established fact, and, however, he may arrange the times of the eruption of the permanent teeth, he will not prevent the second molar from advancing when the first is removed.

Most men, of any experience, know to their cost, that should the first permanent molar be removed, and the patient, from neglect or other cause, not come back for some months afterwards, in a case say where a plate was to be fitted to draw back the front teeth, that the room obtained by the operation, is nearly lost by the advancement of the second molar, with little or no change in the position of the bicuspids.

If, as Mr. Conner contends, the second molar does not advance, regulation plates in cases of protruding superior maxillæ are never necessary, all one has to do is, to take out the first permanent molar as early as possible, and nature will correct the deformity, the only little drawback being "depression at *alæ nasi*, &c.

I think, however, some disappointments will occur, and that the dentist will have an unpleasant time of it later on in his own mind, and with the parent of the patient. What kind of instruments are used for the extraction of molars in Akron O. we are not told, slightly murderous? the result of the operation being similar to the fracture of a shaft bone; Mr. Conner's own case for instance, where exfoliation was taking place from the 10th to the 16th years. A grosser care of mismanagement of a mouth could hardly be cited, and to use it to build an hypothesis on does not give much weight to the subsequent deductions.

Because the author "has never observed one such instance" viz. :—the advancing of a first molar, ergo, no such thing is known. Well, I have seen many such cases, and can show the models of a mouth, where the bicuspids having been removed from both sides of the upper jaw (why, I cannot say) the molars have advanced till they are in contact with the canines; that there was little falling back of the canines is proved by the lower bicuspids being in position and locking hard behind them.

Extraction of the first permanent molars in full mouths, due consideration being given to surrounding circumstances, is of the greatest advantage, care being taken to prevent advancement of the second molar by a properly made plate, the best time for the operation being when the canines are well through and the second molars also, in my humble opinion, but that any one in his sober senses would advise the extraction of the first permanent molar at eight years of age (when it is the chief food masticator) for the regulation of teeth which might never appear, is incredible, unless he suffered from absorption of the *alæ nasi*, and the entire cerebellum.

Yours truly,

J. L. Robertson, L.D.S.E.

"The Guardians" and Chloroform Administration.—At a meeting of the Dartford Board of Guardians an application was made by the medical officer for the assistance of a second practitioner when administering chloroform. The chairman said there would have to be an application to the guardians and the question of the advisability could then be considered. The medical officer was called into the room and explained that there was a certain amount of danger in performing an operation under chloroform, and that he would be liable to censure from the coroner if death occurred. It was the rule of the profession to have two medical men in attendance at such a case. After some discussion the board agreed to the calling in of another medical man at an operation, the fee to be charged to the board.—*Lancet.*

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under:

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A FORM OF ULCERATIVE STOMATITIS IN CHILDREN DUE TO DENTAL IRRITATION.

By George Carpenter, M.D. London, M.R.C.P.L.
Senior Physician to Out-patients to the Evelina Hospital for Sick Children.

Ulcerative Stomatitis in children, and by this I refer to a disease attended by the presence of several, or many, circular, or oval, superficial ulcers with a dirty white or grey base and a bright red border scattered—sometimes showing confluence—over the buccal mucous membrane (lips, mouth, tongue and gums) is a very common affection, and is well known to all of us.

Even this short description of it will at once bring it to the mind.

In the same way follicular ulcers—usually single—gingivitis attended by necrotic ulcerations from Scurvy, &c., and Noma are also well recognised. It is not to any of these that I intend to refer the following remarks.

What I am now speaking of is a large, superficial ulceration of the inner surface of the cheek, opposite the teeth of the upper and lower jaw, and frequently stretching to the angle of the mouth. The edge of the tongue adjoining the teeth is often ulcerated in the same way, and at the same time, though less frequently. The cheek on the affected side is found, in many cases, to be swollen, though not usually much altered in colour, and saliva, sometimes blood-stained, dribbles from the mouth, as in ordinary ulcerative stomatitis. The breath too is very foul.

A short reference to two or three cases, before proceeding further, will illustrate my points and give an inkling as to its causation.

Case I.—Rose A—— attended the Evelina Hospital for Children on November 20, 1889. There had been a swelling of the cheek for a fortnight, and she had spat out a "quantity of blood." *On examination.*—On the left side there was ulceration of the cheek opposite the upper and lower rows of teeth, this started from the angle of the mouth. The edge of the tongue on the corresponding side was ulcerated. The surface of the ulcer was of a dirty yellowish white hue. The teeth were covered with unhealthy dêbris of all kinds.

The child was referred to Mr. Denison Pedley for dental treatment and he reported as follows :—

"The teeth are generally carious. The molar teeth are carious, above and below on each side, especially on the left side. The left upper temporary molar is necrosed and evidently keeping up irritation of the cheek. This has been removed. The lower teeth on the left side are carious with sharp edges, and it is proposed to remove them, if necessary, at the next visit."

The child was ordered a chlorate of Potash gargle (gr. x ad ʒ1) and the same remedy (g. x ad ʒ1) internally three times daily.

November 28th. Mouth very much better, still a little ulceration.

Case II.—Lilian L——., æt 4 years, attended the Evelina

Hospital on January 3rd, 1891. She was a well-nourished, healthy-looking child with a slightly swollen face. *Mouth.* On the right side of the tongue there was an irregular ulcer with clearly-cut edges surrounded by a narrow red areola, and covered at the base with yellowish pus. The mucous membrane on the inner side of the cheek, on the corresponding side, was in a similar condition, the ulceration being almost continuous. The tissues of the cheek were somewhat thickened. The glands at the angle of the jaw were enlarged. The upper and lower teeth were covered with food round their necks.

Mr. Denison Pedley reported as follows. The teeth as a whole are good. The right upper first temporary molar is badly decayed on its posterior surface. This seems to be the primary source of trouble—removed. The mother has been told to cleanse the surface of the teeth daily. The child was ordered the same treatment as in the previous case. Jan., 12th.—Mouth is much better. Jan., 19th.—Mouth quite well.

Here is another instance in which the ulceration was much less extensive.

Case III.—William S——., æt. 5, attended the Evelina on Jan., 9th, 1890, and was brought for worms, and "a place on his cheek which bleeds." The mouth showed ulceration on the buccal surface of the cheek opposite the line of junction between the top and bottom molars. The last molar, according to Mr. Pedley—was carious in the lower jaw and there was much débris in the shape of food, etc., about it. A mere enumeration of similar cases would not further matters, and I refrain from doing so, contenting myself with the statement that such are not uncommon in out-patient practice. Sometimes the gums corresponding are spongy, and readily bleed, and they may be surmounted by necrotic ulcerations. With these cases there may be a slight amount of febrile disturbance, and the corresponding submaxillary glands may be enlarged and a little tender. The infiltration of the cheek, more than once, has made me suspicious of cancrum oris, but it will be noticed that the induration in this variety falls very short of the infiltration seen in that disease, and though the cheek is often swollen, yet it is not brawny. The ulceration is sometimes pretty deep, but no central gangrenous slough will be detected.

It is quite possible that such a condition might invite the advent of Lingard's bacillus (Bacillus Nomæ) but as yet I have not met with an instance. Of course I am quite aware, and we all know, that a sharp tooth will occasion ulceration of the corresponding soft parts, but it is not generally recognised that dental troubles in children will bring about such extensive ulceration as I have described, an ulceration passing far beyond the seat of local irritation. That this extensive ulceration is greatly favoured by the close apposition between the teeth and gums, and the cheek, cannot be doubted. This facilitates the accumulation of food and dêbris, organismal and otherwise, and together with the warmth, the immobility of the parts from pain and what not, disposes to the spread of the disease. Given the original breach of surface from a jagged tooth, the process then quickly becomes an infective one.

Just such another ulceration is seen in Intertrigo—in the groins, for example, in infants, brought about by improper attention to cleanliness.

First a little redness is noticed in the groin and an acrid secretion collects there. Next a deeper dermatitis, induced and kept up by the unhealthy discharges accumulating there, makes its appearance. Then the thighs are more constantly flexed upon the abdomen, to relieve the tension of the parts and the irritation. Here they are kept, which further confines the materies morbi, and if the child is not properly attended to, from the pent up unhealthy secretions between the opposed surfaces, deep ulceration makes its appearance, in some cases gangrenous even, and sometimes this is followed by the death of the patient from collapse or Septicæmia.*

In much the same way the extensive buccal ulceration which I have described can be accounted for. But whilst using this analogy it will not do to lose sight of another point.

In the *British Journal of Dental Science* for June 1st, 1892, when I last had the honour of addressing you, I published a short article on "Herpes secondary to Tooth-ache," and it is to this I would now refer.

There I described Cutaneous Herpes from dental irritation, but it is quite possible that such an eruption might limit itself to the buccal surface of the cheek, and the corresponding side of the tongue, one or both, and the gums, or not, as the case may be. All these parts are under the sensory nerve control of the two lower main divisions of the 5th pair.

Vesicles formed in a moist situation, like the mouth, would quickly become sodden, break down, and leave an ulcerated surface.

Given then this as a cause of the primary breach of surface, the decomposing secretions, &c. would tend to keep up the mischief.

I merely, however, throw out this latter as a suggestion. I have no clinical observations in my notes to prove or disprove such a theory. The possibility, however, must be admitted, though the points are perhaps in favour of the original suggestion.

With the removal of decayed and necrotic teeth, the cleansing of the sound, and the administration of chlorate of potash internally and locally, what appears at first sight, to be a very nasty case of Ulcerative Stomatitis will quickly succumb, and heal up very rapidly.

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* These extensive cases of ulceration and gangrenous intertrigo are not generally known to the medical profession.

ADDRESS TO THE STUDENTS OF UNIVERSITY COLLEGE.

By S. J. Hutchinson, M.R.C.S.,L.D.S. Eng.,
Clinical Lecturer on Dental Surgery in University College,
and Dental Surgeon to University College Hospital.

[The following are the portions of Mr. Hutchinson's Address which are most interesting to Dental readers.]

I must say that the State, and by the State I mean especially the Medical Council, which, subject to the Privy Council really manages our affairs for us, the State might be called upon to do a little more than it does for the medical practitioner. The State insists upon the medical student undergoing a five years' curriculum of severe study in all sorts of subjects; it compels him to pass difficult examinations at all periods of his career, and then when he has done everything, and satisfied everybody, and got his degree or diploma, what does the State do for him? Does it protect him in any way against the bone-setter, the herbalist, the medical electrician, the mesmerist, the midwife or the prescribing chemist, or the legion of American and other foreign gentlemen with a maybe bogus degree? Does it give him one single advantage over these gentlemen beyond allowing him the privilege of sueing for his fee in the County Court, of being exempt from juries, of being placed on the medical register, of holding certain public offices, and most glorious privilege of all, it allows him to sign the death certificate, when "at the last stage of all," he is called in with the forlorn hope of restoring new life to the victim, maybe of one or other of the practitioners I have named above! And what is the penal clause? It is one which is emasculated and inert, because in order to convict an unlicensed and unregistered person, it is necessary to prove, beyond all doubt, so as to satisfy a British jury that the said person *wilfully and falsely* represented himself to be a duly qualified practitioner with *intent to defraud.* Now, I maintain that this is carrying the liberty of the subject a trifle too far, and I think the day is not far distant when it will be impossible for any of these gentry to practise any form of the healing art unless they are entitled to be registered. I would welcome with open arms any foreigner, be he American, German, Frenchman or Italian, who could prove that he had passed a curriculum and an examination equal to our own, and I would, on public grounds, let him compete on equal terms with our own men, and let the best man win, but I would make short work of him if he could *not* prove his right to an equal standing in education and examination.

Gentlemen, if you went to start in practice in any country of Europe, except Great Britain, without having passed their medical examinations, what would they do, would they welcome you with open arms, would they allow you to put up brass plates with Dr. this and Dr. that, and to practise in their towns and cities? No, they would not. What would they do? They would instantly pay you a domiciliary visit and give you a friendly (more or less) warning, and if you did not take the hint, they would probably confiscate your property and politely escort you to the nearest frontier, if they did not first fine and imprison you! Now, I don't mean to say that this kind of thing is exactly what I want in England, but I do want a little more sympathy shown to those of you who devote time, and energy, and money in fulfilling the requirements of the State, by which the British public is supposed to be protected against the charlatan and the quack, and I want the legally qualified practitioner to receive a little more help than he gets at present. I think too that there ought to be another general practitioner on the Medical Council and at least one dentist, as the Medical Council administer the Dentists Act as well as the Medical Act but at present there is no dental representative.

It would be well now to consider what the medical student had best do when he shall have duly and fully qualified, and he will probably, by that time, have discovered whether he has developed any particular taste for, or proficiency in, any branch of the science of medicine or surgery, or if he prefers to work at some scientific subject, such as anatomy, physiology or bacteriology.

Those of you who desire or determine to become general practitioners, and such it is to be presumed the majority of you do, I should like to refer to the introductory address given here by Professor Victor Horsley, in October, 1891, for you will there find some very practical and useful advice bearing upon this subject, which it would be superfluous to reiterate.

But there is one branch of practice, which provides at this time a very satisfactory opening, for such of you as are possessed of manual dexterity. The opening for practice is afforded in dental surgery, a diploma being granted by the Royal Colleges of Surgeons throughout the Kingdom. The curriculum for this license runs on exactly similar lines, as that of the conjoint diploma, as far as anatomy, physiology, dissections and lectures on medicine and surgery, are concerned ; but it does not require so much Hospital practice in medicine and surgery, nor in pathology, or obstetrics, but in place of these it requires two years' *Dental Practice* at a special hospital, or special department of a general hospital, as well as courses of lectures on dental surgery, dental anatomy, dental mechanics, and metallurgy, and three years in a dental laboratory. This curriculum must be preceded by the passing of an examination in arts, the same as for the conjoint diploma, but it only requires four years instead of five. Let me say, however, that I do not think this difference will long exist, for those of us who are specially interested in the dental license, have all along endeavoured to assimilate it with the conjoint diploma, so as to offer every possible inducement to dental students to secure both diplomas, and I am glad to say, that many of our best junior men, have found it quite possible to do so.

By way of emphasis, I would repeat, that the dental diploma runs exactly on parallel lines with the conjoint diploma, as far as the scientific education is concerned, and only diverges by supplanting some of the medicine and surgery by dental surgery.

The new five years' curriculum, has a clause, which, compels students to pass six months of that time, in a special hospital, and I trust that dental hospitals will be included amongst those special hospitals, for even this short training would be of immense benefit to those who are going into the army, or naval, or missionary, medical services. Indeed, it is satisfactory to be able to make public recognition of the fact, that the Director-General of the Naval Medical service, has within the last few months ordered a limited number of naval surgeons on furlough to various hospitals, with a view to their acquiring a knowledge of the elements of dentistry, more especially those relative to the immediate relief of pain.

Now, gentlemen, students of this college, you are singularly favoured in your opportunities for acquiring a knowledge of dental surgery, on account of our proximity to two Dental Hospitals,—one in Leicester Square, and one in Great Portland Street. The latter is being rebuilt so as to have every modern convenience, and appliance for efficient instruction, and practice in dental surgery, and it is less than ten minutes walk from this college. The Dental Hospital in Leicester Square is the largest, and oldest, and has associated with its teaching staff, many well-known names, and it is not much further away than the hospital in Great Portland Street, and the work at both these hospitals can be carried on by any of you at University College, along with your medical work—if you wish—by a careful arrangement of your time. In the face of these advantages it does not seem desirable for University College to follow the example of Guy's Hospital and establish a Dental School within our walls, for whilst Guy's was more than two miles from any dental school, we are less than a mile from two. Personally, I am very much averse to a multiplication of schools, either Medical or Dental, except where fully justified by questions of time and space.

And, now, gentlemen, whilst I have fully and fairly put before you the advantages of the dental license, I sincerely trust that if any of you decide to adopt the dental branch of our great profession you will, as well, make up your minds to take the conjoint diploma, or degrees at the Universities if you can ; and you may take my word for it that you will never regret the little extra time and work which will be necessary. The Dental diploma, required by law, 1878, is a very good one, and it requires actually more medical education than the Medical Act of 1815 required of the medical practitioner of that date.

Before I leave this question there is one point worthy of notice about the Dental curriculum, and that is the fact that in the examinations, candidates are liable to have questions asked them in every subject on which they are taught, and to perform every operation, except extraction, which they may have to practise. Now this is a point worthy of notice, for it is not much use to expect students to attend lectures or demonstrations if they are not to be examined in them afterwards. With regard to the professional status of the Dentists, it is worthy of notice that there are the Odontological Society of Great Britain and the British Dental Association, the latter with branches all over the Kingdom, to which they can belong *provided they do not advertise their skill or their charges*, and provided they conduct their practices in a professional manner. These Societies, by these ethical laws, have done, and are doing much to instil a truly scientific and honourable spirit amongst their members.

HOW TO GIVE GAS.

By Thomas Edward Constant, M.R.C.S., L.R.C.P., L.D.S., Eng.

(*Continued from page* 875).

Mode of Administration.

Just as with the administration of other anæsthetics it is necessary to first establish the confidence of the patient, and there are a few things which should be done with this in view. Although so much, of course, depends upon the tact and personal address of the anæsthetist, obviously there are certain principles which should guide his conduct.

Chief among these should be placed a calm and assured manner. The slightest indication of flurry or nervousness is at once detected by the patient, and confidence is correspondingly shaken. Next, all preparation of the apparatus should be made out of sight of the patient. Nothing is more calculated to try the nerve of anyone to whom the administration of gas presents peculiar terrors on account of absolute ignorance of the method of its administration, than to have brought into the room with much fuss and ceremony the (to the unaccustomed eye) truly portentous gas cylinders ; and the fears thus aroused would be by no means calmed by its being found necessary to delay the administration while a fresh cylinder is fitted to replace one previously emptied. Yet, if we may believe the statement of our patients, such things are not infrequently done.

While writing, I recall an instance in which a patient asked to see the apparatus at the conclusion of a successful operation, and, being shown it, related a previous experience of hers, which was as follows:—

She consulted a dentist who advised the administration of gas for the extraction of a tooth. Never having previously taken any anæsthetic she was at first reluctant to comply. Her scruples being overcome, a gasometer was wheeled into the room with much ado and placed beside the chair. As if this were not sufficiently disconcerting, a gas bottle was fixed beneath it, and, as the patient expressed it, 'exploded,' from which it may be inferred that it was turned on suddenly and with great noise. The result of these manœuvres was to so thoroughly frighten her that she struggled when the face piece was applied, and, in the end, the tooth was extracted without an anæsthetic having been administered at all, and no doubt (although that was a point she did not mention), with great loss of time to the dentist.

I do not suspect that such a thing is often done now-a-days. I mention the circumstance as a glaring example of what is particularly to be avoided.

At the same time, however, it is not a bad plan in some cases where the patient has never previously taken gas, to illustrate the method in which it is inhaled. This, of course, can be done a few seconds before applying the face-piece, and does not necessitate exposure of the gas cylinders.

Another thing that is calculated to alarm the patient is the adjusting of the mouth-prop; *apropos* of which instrument, I may here remark that the simpler its form the better. Some dentists use a little brass spring gag about an inch long, and considerably less in diameter than an ordinary lead pencil. This is a very dangerous form, and when it is used the anæsthetist must be particularly careful to ensure that it is securely fastened by string or cat-gut, which should be sufficiently long to hang some distance from the mouth when the gag is in position, and to the free end of which another gag should be attached. The safest is one made of vulcanite, and sufficiently bulky to render its falling into the larynx an impossible accident. This prop is easily cleansed, is inexpensive, so that several of different sizes may always be kept, and being very strong is not easily broken,—and if skilfully adjusted is scarcely more liable to slip than the more complicated forms of spring gags. If soft rubber be vulcanised at each end, it is useful in cases where it has to rest upon the gums.

As it is preferable that the anæsthetist should adjust the prop himself, it is as well to state that teeth form a firmer resting-place for it than the gums, so that when the back teeth are missing on the side opposite to that on which the dentist intends to operate, it should be placed between the front teeth, if it is possible to do so without encroaching too much upon the space necessary for the introduction of the forceps into the mouth. At the same time, loose or very badly decayed teeth should not be pressed upon by the prop, because should one or a portion of one become dislodged it would be a source of great danger to the patient.

In adjusting the gag, the patient should be persuaded to open the mouth to the widest extent compatible with comfort as the chances of it slipping are thereby lessened. Its use should be explained, and it should not be inserted until the anæsthetist is quite prepared to administer the gas. Few things are more distressing to a patient than to have the mouth widely gagged and then to have to wait some time before the commencement of the adminstration.

Perhaps it should here be mentioned that a gag is always necessary in dental cases. Gas anæsthesia does not imply muscular relaxation and is so brief that in the time expended in forcing open the mouth the patient would probably recover consciousness. Indeed, it is advisable that it should be employed when gas is given for minor operations elsewhere than in the mouth for reasons that will be presently obvious.

Another practice to be condemned as unnecessarily alarming is the anæsthetist's insisting upon a stethoscopic examination of the chest. Although in a few instances, perhaps, this procedure may tend to reassure rather than alarm the patient, (in which case there is no objection to its being done) yet, generally speaking, it is as harmful as it is unnecessary; for there is no conceivable condition of the thoracic viscera that such examination could reveal that would contra-indicate the administration of nitrous oxide if the patient's general health were sufficiently good to admit of a visit to the dentist.

There is another point I should like to touch upon in this place, namely, the previous preparation of the patient.

Now, of course, every medical practitioner knows how absolutely essential it is that the patient's stomach should be empty during the administration of ether or chloroform, and it is only natural that he should regard it as being equally necessary during the administration of gas. Such, however, is not the case, and, although it should not be given immediately after a heavy meal, most dentists could testify that no unpleasant immediate or after effects are liable to be occasioned by its administration even within an hour of a patient's taking food.

A much more important consideration than this is that the patient should not have previously taken alcohol in any form within a short time of taking gas. All alcoholic subjects are particularly troublesome gas patients, and even those who are not in the habit of taking stimulants are much the worse for indulging, as they not infrequently do, in 'a glass of something' before their visit to the dentist, to keep up their courage during the trying ordeal in prospect. Against this, therefore, they should be particularly warned.

A precaution which is also of very great import, and one that cannot be too much insisted upon, is that the patient's clothing about the neck and waist should be quite loose. Not a few of the unpleasant effects so often attributed to the gas are due solely to want of attention to this particular. The sensation of choking of which nervous patients of the female sex so often complain, arises more from the embarrassment of the respiratory movements consequent upon a tightly-laced corset than from the fact that their mouth and nostrils are covered by the face-piece. Therefore, for the comfort as well as the safety of the patient, it is absolutely essential that the anæsthetist should be firm upon this point, placing more reliance upon his own observation than upon any statement of the patient, who, the more tightly she be laced, the more certainly will she deny it.

A matter that can scarcely be considered as coming under the classification of preparation of the patient, but which suggests itself here, is the question as to the advisibility of admitting patients' friends to the surgery during operations under gas. If they can be excluded so much the better; but very often, when the patient is a lady, the presence of a female friend does much to reassure her, so I certainly do not think that the rule should be strictly enforced. At the same time, any spectator should be placed where it is impossible to obtain a view of the patient's face or to see much of the operation, and strict silence must be enjoined. It is, however, far preferable that no one be present except the patient the operator and the anæsthetist, assistants or spectators being dispensed with when possible.

But to return to the mode of administration. Let us imagine the patient, with a large serviette placed beneath the chin and spread out to protect the clothing, comfortably seated in the chair, which is placed in the position most suitable for the operation. These things the dentist will have arranged.

After a few seconds of reassuring conversation, during which time the anæsthetist has satisfied himself that the patient's clothing has been loosened, he examines the mouth to ascertain if there are artificial teeth that it would be necessary to remove, although this the dentist will probably have done previously. At the same time he must enquire which teeth are to be extracted. He should then ask the patient if the perfume of eau-de-cologne be agreeable, and whether some should be given with the gas. If the reply be in the affirmative, and in ninety-nine per cent. of cases it is, it affords the anæsthetist the necessary opportunity of assuring himself that both gas bottles are turned on and to partly fill the bag with gas, as even this simple act may alarm a very nervous patient unless some reason for it be alleged. Then spraying some eau-de-cologne into the face-piece, and selecting the most suitable gag, he turns again to the patient to adjust it. Should the dentist, prefer doing this himself, it should havebeen done during this interval.

In adjusting the gag, the administrator should stand behind the chair, sufficiently to the left to enable him, by bending forwards, to see easily into the patient's mouth. When the gag is in position, he should take the face-piece in his right hand and passing it behind the chair to the right of the patient, should rest with his right elbow upon the head piece or back of the chair. By so doing the right arm is steadied and the face-piece can be firmly but lightly applied ; and this is also the most convenient position for turning on the gas, the cylinders being behind the chair at his feet.

Before adopting Hewitt's apparatus I thought an objection to it was that the bag, being so near the face-piece, would be apt to alarm the patient. Experience has shown that this is not so, because if not too fully distended with gas it is below the line of vision of the patient, or at all events never seems to attract attention. If too full, it not only renders it difficult to apply the face-piece if the patient be a lady of ample proportions but is the more likely to create alarm. If the patient be a man with a heavy moustache the ends of this should be twisted inwards towards the mouth so as to come well within the pad of the face-piece; if with a beard, the lower part of the face-piece should be applied near the lower lip and the beard well damped in that situation ; for it is of course most necessary that air should be absolutely excluded.

The face-piece being applied, it should be held with only sufficient pressure upon the face to prevent the entrance of air, undue pressure being very discomforting, particularly if an in-elastic face-piece is used. In women, the places where air is most likely to be admitted are by the sides of the nose, or, if the patient be very hollow-cheeked and the mouth opened widely, near the angles of the mouth. In the former place it is best prevented by compressing the pad on either side of the nose between the fingers and thumb of the left hand. In the latter situation this should not be done, partly on account of the difficulty of doing it, and partly because it would almost certainly cause air to be admitted by the sides of the nose.

The best way of preventing it, as was pointed out to me by Mr. Woodhouse Braine, is by pushing a fold of cheek against the pad on either side.

As soon as the face-piece is satisfactorily applied, no time should be lost in allowing the patient to inhale the gas. During the early part of the administration it is as well to keep a continuous stream of gas flowing into the bag to take the place of that inhaled. It is a bad practice to allow the bag to be nearly emptied and then to suddenly fill it almost to bursting, for in either extreme respiration is rendered more difficult.

If a few reassuring words are addressed to the patient while the gas is being inhaled, there is less likelihood of the administration being suddenly checked by an unlooked for attempt to remove the face-piece ; this being of not infrequent occurrence in the case of children, and for it the anæsthetist must always be prepared, and check it by such means as the age and temperament of the patient may render necessary.

But of all matters connected with the administration of gas, the one of most practical importance is that next to be considered. What are the indications that enable us to tell when the patient is fully anæsthetised ?

Any one familiar with the use of ether and chloroform, but ignorant of gas, would immediately reply, "loss of the conjunctival reflex." It cannot, therefore, be too strongly enforced upon such that if gas be pushed in all cases till that loss becomes evident, in not a few, artificial respiration would have to be resorted to, even if matters did not proceed as far as a coroner's inquest.

As a matter of fact, there is no one sign that can be implicitly relied upon as always being present to indicate the exact period at which the administration should be terminated. Such knowledge is perfected only when, by practice, it becomes an instinct. This paradox any one thoroughly experienced in gas administration, will readily understand.

At the same time there are a few indications of value to the inexperienced. Chief among these many place stertor and jactitation, but it must be remembered that these may both be absent even when the administration has been dangerously prolonged. Loss of the conjunctival reflex, when present, greatest value ; but let me here repeat (for it cannot be too is of the often repeated), that any one who pushes gas in all cases, until this become evident, exposes his patients to a most serious and unnecessary risk. Generally speaking, there is a marked change in the character of the respiration when anæsthesia is established, and in the majority of instances administration may be continued until some such marked alteration occurs ; but perhaps a few general remarks may do more to help to elucidate the point in question than an enumeration of signs and symptoms that may, or may not, be present.

Children and anæmic people require less gas, are more rapidly anæsthetised, and dangerous symptoms declare themselves sooner than with adults and robust individuals. Alcoholic subjects most resist the action of gas, and, unless a large quantity be administered, are sure to struggle during the operation. Hysterical women resemble alcoholics in this respect, probably from the fact that many of them before the operation indulge in the "glass of something" previously mentioned.

The statement that children more rapidly develope dangerous symptoms during gas administration is one that may be questioned by those who know how easily they are brought under the influence of an anæsthetic, but this very facility constitutes a danger when gas is given by the inexperienced, for jactitation might possibly be mistaken for struggling, and the gas pushed until respiration ceases. Half a dozen inspirations sometimes suffice to anæsthetise a child sufficiently to render the extraction of a tooth a painless operation. I mention this, not to advocate operating in the case of children before they are fully anæsthetised, as I fear is sometimes done by those who have had a painful experience of the danger of pushing gas in such cases, but simply to give an idea of the extreme rapidity with which anæsthesia can occasionally be induced. On the contrary, I must state that it is my impression that there is less likelihood of the gas being pushed too far, than of danger resulting to the patient from the operation being performed before consciousness has been obliterated.

This is shown by the numberless instances in which patients who are advised to take gas refuse on account of having taken it previously and "felt all the pain."

(*To be continued*).

A Wind-fall for Hygiene.—The promotion of hygienic principles throughout our country should receive an undoubted stimulus, if money can do any good. In accordance with the bequest of the late Mr. Berridge, the sum of £152,000 has been allotted to several Societies, Associations and Institutes, which have for their object the advancement of knowledge upon health matters, and the prevention or cure of disease. Under this scheme, the National Society for Promoting Education, and other like Societies, are to receive £50,000 to be exclusively applied towards teaching cooking in the voluntary primary schools of England and Wales, whilst the National Training School of Cookery at South Kensington, receives £5,000. The Sanitary Institute of Great Britain, University and King's Colleges, are down for £10,000 each. The arrangements for the British Institute of Preventive Medicine we have previously alluded to, and amongst other Bodies receiving smaller sums, are the National Health Society and the College of State Medicine. £20,000 is to be devoted to a scheme for the education, examination and registration of plumbers.

British Journal of Dental Science.

LONDON, OCT. 15th, 1892.

THE INTRODUCTORY ADDRESSES.

In accordance with the usual custom, the opening of the winter session at the Medical Schools was observed, in many instances, by the delivery of an address to the Students. The gentleman selected for the duty of framing the expression of welcome to the new-comers, is generally someone well-known in connection with the individual school, and it is commonly acknowledged that he is, from his position, to be entrusted also with the liberty, or perhaps it should be termed a duty, of discussing other important subjects. These, presented in the varying form conferred by different lines of thought, or mode of expression, and thus bearing evidence of the personal equation, are none the less interesting on that account; indeed, their value as *ex cathedra* statements is enhanced. Especially is this latter condition true when it is found that, without previous consultation, or knowledge as to what form other utterances will take, a unanimity of opinion is manifested by the expressions employed by different speakers. A study of the addresses reported in the Journals, shows that certain fundamental ideas existed in the minds of several different teachers when preparing the matter to be presented to the receptive intelligence of the Student. No doubt this consensus of opinion may be partly due to the difficulty of discovering anything absolutely new to say, but the advance of Science, and the recording of new facts of interest and worth, is sufficiently fast to provide matter with which to fill out, and round off, the orthodox address.

The necessity of recognising the patient as a human individual, and of studying him as such, was alluded to by several speakers. The modern tendency is for the administration of drugs to become less a matter of routine, and a consideration of the personal characteristics and particular environment of the patient enables much to be done in restoring a healthy relationship between these two factors. Dr. Luff thought that Voltaire's satirical remark about an apothecary pouring drugs, of which he knew little, into a body, of which he knew less, does not altogether apply to the physician of to-day. Dr. Bowles was of opinion that long and complicated prescriptions are to be avoided. "Not a single drug ought to enter the body, except under clear intention of what object it is to fulfil there." Dr. Coupland pointed out that the place taken by drugs in the treatment of diseases is very often a purely subsidiary one, although there are many occasions where the prescription of appropriate remedies is of inestimable service. "The difficulty lies in affirming, in many cases, what is the precise nature of the change introduced into the economy by the administration of physic. And this difficulty is enhanced by the fact that we deal with patients, living individual organisms, and not with abstract morbid states." Dr. Mercier remarked that the doctor no longer contented himself with administering two table spoonfuls of physic, three times a day, which was often little better than wearing an amulet round the neck, but "sought to take the whole mode of life of the patient into his hands and to modify and regulate it in accordance with the new conditions that the malady requires."

Another point upon which stress was laid was with regard to the ground-work upon which the student should rely for successful combat with disease. At University, St. George's, and Middlesex, attention was particularly directed to the necessity of Anatomy, Physiology and Pathology, and at Owen's College Dr. Broadbent declared that the latter subject, at the present time, surpassed in interest every other department of study and research. Mr. Hutchinson and Dr. Luff both took the opportunity of giving good advice as to so cultivating a proper method in dealing with hospital patients as to show, by habit, in after life, a proper consideration for the feelings of rich and poor alike. These excellent recommendations hold good also for dental students, who, from the essential nature of their work at the chair-side, cannot afford to divert their attention to a studied mode of manner and address, but must rely upon the involuntary manifestation of that conduct which, whether for good or ill, is their habitual behaviour. At University College, Mr. HUTCHINSON, as might be expected, also alluded to the honourable career which the practice of Dental Surgery now affords for such students as possess manual dexterity, and showed his audience the similarity in curriculum, examination, and registration, which obtains in regard to medical and dental diplomas, and which is probably destined to become still more exact as time goes on.

The several addresses are worth studying in detail by those interested in documents which help to form the history of medical and surgical progress, and if the listeners realize the task set before them, and act up to the advice proferred, the future race of practitioners will not leave much to be improved upon.

CONGENITAL ANOSMIA.—Experiments have recently been carried out in the case of a student who was absolutely destitute of the sense of smell. It is suggested that the results showed the greater number of so-called taste perceptions to be really dependent upon the sense of smell. Thus, the patient referred to, was unable to distinguish between tea, coffee, and hot water, but was able to differentiate ether, water, and ammonia. Different fruit syrups merely gave a sensation of sweetness. The sharpness of mustard and pepper was recognized, but they could not be distinguished, although loves and cinnamon were. Differences of one degree of temperature were easily recognized, and we are told that taste, as well as common and thermal sensibility were undisturbed, although to the ordinary mind, it would seem that the unfortunate youth was not only deficient in the sense of smell, but also suffered from a marked modification of the gustatory function.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The Annual Calendar, which has just been issued, shows that during the last collegiate year, 81 candidates presented themselves for examination for the Licence in Dental Surgery. Fifty one received the diploma, and thirty were referred. The fees paid by the candidates amounted to £535 10s. and of this sum £340 4s. was paid to the Board of Examiners, which consists of eight members, elected by the Council for five years. The examination in Anatomy and Physiology for the diploma of Fellow, otherwise known as the "First Fellowship," seems to still remain a severe test, and its stringency may be judged from the fact that out of 155 candidates, 91 were referred. The income of the College was over £39,000, of which more than £20,000 was derived from the fees paid by candidates for diplomas, £560 being returned. The fees paid to the examiners amounted to £9,256.

THE DEGENERATION OF HUMAN TEETH.—The present number of the *New Review* has an article by Mr. J. L. Williams, a dentist, which is calculated to awaken a personal interest in the subject. The usual facts are marshalled in a sufficiently succinct manner to claim the attention of the magazine reader. In the writer's opinion, there are many dentists who are still unaware that when once the formation of enamel is completed, it is useless to recommend patients special forms of food with the idea of improving the structure of that important tissue. There may be such practitioners; we hope they are not many. The author goes into detail with regard to preventive measures and the hygiene of the mouth, and when the advisibility of systematic inspection is realized by the public, in order to secure early treatment of caries before the pulp is approached, then perhaps, as the writer says, two thirds of the fees now paid to dentists might be saved. With most of the advice given, we can cordially agree.

RIDGED INCISORS, AND HONEYCOMBED MOLARS.—One point of interest in the article just mentioned caught our eye. When considering the causation of pitted teeth, and explaining how interference with the development of enamel produces the ridged tide-marks on the surface of a tooth, the author, it appears, holds the view that the part of the tooth nearest the gum is formed first, and is often free from these markings. Observation shows that the calcified cap first appears on the summit of the developing tooth, and we are inclined, therefore, to believe that the business end of the crown is first formed, and possibly may show deficiencies of enamel, and that, if the disturbing influences then subside, perfectly formed enamel may cover the cervical portion of the crown. Surely the condition named shows that the teeth were half-formed while these violent disturbances of nutrition occurred, and not, as the writer puts it, before.

SIR JAMES CRICHTON BROWNE, of the Royal Institution of Great Britain, has received from Mr. Thomas Hodgkins, of Satanket, Long Island, New York, the munificent donation of £20,000 to the funds of the institution, to be applied to the promotion of scientific research. Mr. Hodgkins recently presented £40,000 to the Smithsonian Institute at Washington.

Reviews.

Anæsthetics, their Uses and Administration. By Dudley Wilmot Buxton, M.D. Second edition. London: H. K. Lewis, 1892.

The author is well-known as one whose position and work not only qualify him for writing on the subject of anæsthetics, but make it almost imperative, as a duty towards his fellows. Especially do dentists owe Dr. Buxton a debt of gratitude for the observations he has carried out with regard to nitrous oxide, for he has done much to render the administration of this gas a scientific proceeding instead of a merely empirical one. The production of a true anæsthesia without asphyxial symptoms is better understood, and has become the ideal point to be realised.

The present edition of "Anæsthetics" contains 222 pages, and many woodcuts. It deals with the whole subject, including history and medico-legal aspects, concisely and in a manner easily to be understood. It has been written from the standpoint of every day practice, and the author, in alluding to questions where there is a difference of opinion, shows the true scientific spirit, and credits other workers with whatever may be due to them. We have read the book with pleasure and profit, and can safely recommend any one interested in the production of anæsthesia to follow our example, in expectation of the same result.

"The Development of Human Teeth," Röse.

The following is from Dr. Burckhardt's review in the pages of *Deutsche Monatschrift für Zahnheilkunde.*

The work in question is the first which treats of the development of human teeth from the earliest stages. A precise table gives us the summary of the appearance of the so-called milk, and corresponding teeth. By means of a careful study of abundant material, (18 embryos, and 9 children) the author has introduced order in the numerous contradictory statements of Kölliker, Kollman, Waldeyer, Baume, and Morgenstern.

The following are the most important results. The first trace of the tooth-band is found simultaneously in both jaws in the form of a hemispherical section amongst undifferentiated round cells which constitute the developing epithelium of the jaws. This occurs at the embryonic age of 34—40days. In an embryo 17 mm. in length, about 48 days old the simple band is already split up into two secondary bands lying perpendicularly to each other. One passes vertically into the jaw and is the "labial-furrow-band" (*Lippenfurchenleiste*). The other extending horizontally backwards is the true tooth band. At this time the deepest layer of the epithelium already consists of long cylindrical cells. In the 10th week the covering of the papilla by the epithelial thickening of the tooth-band commences, and this not at the deepest part, but laterally. By the peculiar capacity of the tooth-band for adaptation it is possible that, behind the last molar, remains of the band persist and give rise to further tooth formation.

In addition to this the work in question presents abundant facts of the development of human teeth in detail. But the main point consists in that here, for the first time plastic pictures of the development of the tooth-band are brought before our eyes, and which show at a glance more trustworthy representations of the developmental processes of the teeth than was hitherto possible. The author has thoroughly worked several of his series of sections with great industry after Born's method of modelling, and by means of these models, which will be reduplicated at Ziegler's studio, he has provided a means of instruction which for teachers as well as for pupils must be indispensable. We refer to Röse's figures 3, 5, 6, 7, 9, 10, 11, which represent these models.

[We have not seen the book in question and are not certain how far the claim made as to priority in describing the earliest stages of tooth-development holds good. We have seen plaster representations of the developing enamel organ, but do not remember to have seen them reproduced as illustrations to a book. *Ed., B.J.D.S.*]

"Note-Book for Dental Students," (Dental Anatomy and Physiology). By James F. Rymer. Second Edition. London: C. Ash & Sons, Limited, 1892.

We are glad to welcome anything of service to the Dental

Student. In the preface to this little book the author states that he has collected the chief matter connected with Dental Anatomy for the express object of his work proving useful prior to examination, and he alludes to the necessity of first mastering the general text-books. Such statements disarm criticism, but whilst making every allowance for the exigencies of condensation, we have met with some instances where the useful fly-leaves bound up with the text may prove serviceable. For example, the passage referring to the hinge attachment of Teeth, more particularly that part describing the arrangement in the Pike, needs alteration, whilst the briefest allusion to "bone of attachment" does not necessarily recall its life-history and function of which there is no hint beyond the name. With regard to the reticulation seen on staining Nasmyth's membrane, an explanation suggested in our standard text-book is here apparently described as a "Fallacy," though the text may possibly be taken to mean the opposite. Again, the student who, unfortunately, may wish to refresh his mind at the last moment as to the origin of the enamel organ for the first permanent molar, will not find it mentioned in the paragraph dealing with the other permanent teeth. In the second part of the book, dealing with Comparative Dental Anatomy, the older classifications are perpetuated. Horny teeth are practically ignored, and upon turning to the index for information, we are merely referred to the existence of horny pads in the Chelonians. In regard to the anchylosis of lizards' teeth, we should suggest that the term *Pleurodont* does not apply to an "external parapet of bone," but rather to the method of attachment, or to the entire dentition. In crocodiles it is the fourth and not the fifth tooth in the lower jaw which passes into a lateral notch in the upper. Omitting other points marked for criticism, we content ourselves with expressing doubt as to there being "nothing peculiar about the incisors and canines" in the Tapir's upper jaw. The mode of spelling in some instances, such as calcosphirites, and plurodont, may probably be attributed to printer's errors. The book will, no doubt, serve the purpose for which it is intended, and its convenient size and interleaved fly-sheets will probably attract the student.

Abstracts of British & Foreign Journals.

THE INTELLECTUAL INTEREST OF THE STUDY AND PRACTICE OF MEDICINE.

By W. H. Broadbent, M.D.

What is it which, to those who are mentally and morally fitted for it and who enter it from genuine inclination, makes the medical profession the happiest career a man can choose? For such it really is. To this I answer, first and foremost the opportunity for free and continuous exercise of the intellectual faculties. With the elevation of the race have been developed intellectual appetites. There is a hunger and thirst after knowledge and a passionate desire for achievement, and the pleasure and satisfaction attending the attainment and employment of knowledge are as much higher and more durable than the gratification of the senses as mind is higher than body—as intellectual operations are superior to sensation. All the sciences are laid under contribution by medicine. As you master the principles of chemical structure and affinity, as you come to understand the relation between chemical action and the absorption or evolution of energy, thermal, electrical, and nervous, your ideas are enlarged, your imagination is excited, and the intellectual interest is awakened, which is gratified at each further step you take, but never satisfied. Pathology at the present moment surpasses in interest every other department of study and research. For a long time it was almost identified with morbid anatomy, and concerned itself chiefly with results; but it has emerged from this stage, and the attention of the new school of pathologists is concentrated upon processes, and the method of experiment in their hands is yielding results of surprising value and importance. The discussion before the Pathological Society on phagocytosis was as exciting as a debate in Parliament, and the combats between the cells and invading bacteria as realistic as one of Homer's battles. A septic wound is made, the leucocytes crowd to the spot, block up the avenues by which the hostile bacteria seek to gain entrance into the lymph spaces, and engulf and destroy them, the bacteria at the same time multiplying with amazing rapidity, and endeavouring to disintegrate the cells and to force a passage. This local war is defensive inflammation. If from any cause—the amount of virulence of the infective inoculation, or, in other words, the number, character or activity of the microbes, or, on the other hand, the imperfect afflux or defective vigour of the phagocytes—that is, the inadequate local reaction—the line of demarcation and limitation is imperfectly drawn, the microbes obtain access to the circulation, and in the blood and fluids find an unlimited supply of food and unbounded opportunities of multiplying. It has been known ever since post-mortem examinations were first made or dissection was practised that if a dissection wound were followed by inflammation and abscess the mischief would probably not go further, but that if there were only a little pain at the seat of the cut or puncture, while the lymphatic channels and glands became swollen and painful, fatal septicæmia or pyæmia was probably impending; but it is only now that the defensive process can be understood and explained.

"When I was a student the name zymotic disease, had it is true, obtained a footing in medical terminology, but under protest from many distinguished men who distrusted theory of all kinds. It was pointed out that the analogy between the action of yeast on a solution of sugar and the course of a fever was but weak at best, and was open to the objection that the successive stages of incubation, invasion and decline might represent not the life and work and organism in the system, but the stages of the reaction of the system. Especially were we warned against basing treatment upon such uncertain grounds. Now we know that the parallel holds good down to the smallest particular, just as the yeast grows and multiplies with extraordinary rapidity, splitting up the sugar into carbonic acid and alcohol till its further progress is arrested by the alcohol which is a product of its own activity, so the bacteria multiply at the expense of the fluids of the body, form ptomaines which, like alcohol, act as poisons to the nervous system, and which, again, like alcohol, bring the action of the microbes to an end. Our methods of protection against fevers are now entirely derived from definite knowledge of the life-history of the bacteria or microbes by which they are caused, and our treatment will be more and more determined by such knowledge. We are shown, also, how the defensive processes may be reinforced or impaired. It is well known that drunkards fall ready victims to fever, erysipelas, and septic diseases generally, and the general deterioration of the tissues produced by alcoholic excess has been accepted as a sufficient explanation. But this, while true, is not the whole truth. A bacteria culture of a given kind and degree of virulence is injected under the skin of a rabbit, local inflammation, and perhaps abscess follows, but the animal does not fall a victim to the poison. In another rabbit, or in the same at another time, an injection of the same kind is made, but simultaneously a dose of chloral is injected into some remote part of the body; the local reaction is imperfect, general infection rapidly takes place, and the creature very soon dies. What is the reason? It is that chloral paralyses the leucocytes. They cease to display their wonted activity; examined on the warm stage, instead of pushing out pseudopodia in every direction and undergoing frequent changes of shape, as is observed in the normal state, they are sluggish and retain a spherical form. When bacteria, therefore, are introduced into the subcutaneous tissue, they take no notice of them, but remain perfectly passive, and leave the way open into the lymphatic spaces, whence the invaders pass into the circulation, carrying destruction to every organ of the animal's body. Now alcohol in excess has a similar action on the leucocytes, and this, as well as the deteriorating influence on the tissues of chronic alcoholism, predisposes to septic infection. A single debauch, therefore, may open the door to fever or erysipelas. Protective inoculations against various diseases have been discovered, and had it not been for the ill-judged restrictions on experiment which have deprived this country of the precedence in research which would have been earned for it by the zeal and insight of our young experimental pathologists, we might perhaps already be in the possession of protection against scarlet fever, diptheria, and other diseases, which would do for this country in saving the lives of children what has been done for France in protecting sheep and cattle from anthrax, preventing the loss of hundreds and thousands of pounds to its agriculturists. We have at length, thanks to experiments on animals, learnt the true nature of phthisis and how it is propagated, and we can now not only direct our efforts to strengthening the constitution so as to render the soil unfit, but to the destruction of the seeds. Here our difficulty will arise from the apathy and carelessness of individual members of the community. In politics, and in all other departments of public life, no honourable antagonist thinks of imputing motives. In experimental pathology all our motives are found for us, one worse than another, and we are allowed no credit whatever for a desire to alleviate the suffering of men and animals ; the very highest motive with which we are credited is scientific curiosity, and by this is really meant scientific cruelty. You may drown a superfluous puppy, but if you do it with a view to experiments as to how animation may be restored, you place yourselves within the grasp of the law.

"Scepticism in the sense of a general disbelief in the efficacy of remedies which was formerly not uncommon, and was, indeed, the mark of the 'superior person' in medicine, becomes every day more unjustifiable. At one time, indeed, there was a great gulf fixed between science and practice. Chemistry, physiology, and even pathology were left behind at the door of the hospital ward—were indeed by some carefully shut out. With some few exceptions, and these distrusted, there was no connecting link between chemistry or physiology and therapeutics. The symptoms of disease and the influence of remedies were facts of observation pure and simple, to which it was unsafe to apply reasoning or conclusions drawn from science of any kind. But this is no longer the case. When pathologists were in the habit of looking only at the effects of disease—at lungs riddled with cavities at the liver and kidneys shrunken and hardened by fibroid change, at the brain torn by a hæmorrhage—they might scoff at the efforts of the therapeutist to deal with such conditions, but they have all had a starting-point, and the patients who have ultimately died, have lived through all the stages which have culminated in the ruin displayed on the post-mortem table, while this same post-mortem table has displayed scores of instances in which similar disease has been arrested at one or other of these stages. Processes are now the chief object of study and research, and in proportion as these are understood power will be gained of intervening and counteracting, As we learn how to set in motion morbid changes, we learn how they may be arrested. It is in functional derangements that organic disease begins, in dynamic influences that structural changes have their origin. Perturbation in the activity of cells is brought about by deviations from the normal composition of the blood. Now we can at will introduce into the blood substances which can influence the activity in one direction or another of every cell in the body ; we can intensify or suspend the influence and control of the nervous system over organic operations, and it is our own fault if we cannot employ these tremendous powers for the advantage of our patients. It is true that at present our comprehension of the ultimate mode of action of remedies is very imperfect, and that we have still to be guided by the flickering light of experience rather than by the broad daylight of science, and it is true that experience is uncertain and at times misleading.

"An enormous step towards the comprehension of the mode of action of remedies has been made in the discovery of the antipyretic class of substances. In these, as in chloral, the chemical constitution of a drug is a clue to its effects, so that from the chemical constitution the effects can be predicted, and our scientific chemists know in what direction to push their endeavours in order to obtain a safer or more powerful substance. When this is fully worked out, and we know not only the factor in the drug, by variations of which the results are influenced, but the exact way in which the chemistry of the system is modified and the heat-producing reactions between blood and tissue are restrained, we shall have obtained knowledge going far beyond what we now possess. In the meantime, this tremendous power of lowering the temperature, and of relieving certain kinds of pain placed in our hands by these substances is, I fear, thoughtlessly and recklessly employed. We have so long looked upon a high temperature as denoting the intensity of acute disease, and as an indication of the danger attending it, that the lowering of the temperature has almost come to be considered equivalent to the cure of the disease, whereas, not infrequently, the patient is knocked down as well as the pyrexia, and in any case we ought to bear in mind that we are dealing with an effect, and not with the cause, and that, unless the effect is itself a danger, we may be doing more harm than good. We may actually be interfering with a defensive reaction. So common is the abuse of anti-pyretics, that, from time to time in cases admitted into hospital, the drug has to be diagnosed as well as the disease.

"In what way is the study of medicine to be undertaken? No general recommendation could be made which would apply to all; one intellect is analytical, another constructive; one is characterised by receptivity and the faculty of storing up impressions and facts, another by lucidity in perceiving the relations which underlie phenomena; one man ponders slowly, another is instant in action. Memory, the very basis of intellectual operations, varies not only in degree, but in kind; in one, the memory is visual, and a man retains only what he sees, while he thinks in pictures, in another it is auditory, and he learns by lectures and thinks in verbal associations. You will have to find out for yourselves what method of working suits you best. While I do not interfere with the function of your teachers by recommendations as to the order and method of your studies, I may speak of the spirit in which they should be pursued and of the object you should keep before you. Professor Huxley—let me give him the title recently conferred upon him, but long held by him in our esteem, the Right Honourable Professor Huxley—in one of his lay sermons on education makes this the burden of his exhortation: 'Learn what is true, in order that you may do what is right.' Now, if this applies to the self-training of a man for the ordinary duties of life, it applies with special force to preparation for the medical profession. The sentence might have been devised as a motto for medical students, 'Learn that which is true, in order that you may do that which is right,' and I hope some of you will adopt it and live up to it."

Lancet.

THE APPLICATION AND INFLUENCE OF FORCE IN ORTHODONTIA.

By C. S. Case, M.D., D.D.S., Chicago, Ill.

The operation of correcting irregularities of the teeth by mechanical force is gradually being placed upon a scientific basis, where even the most difficult cases may no longer be considered doubtful problems, or their perfect restoration more than should be naturally expected from the hands of a dentist who gives this department of his profession its legitimate share of his attention.

This is largely due to the somewhat modern adoption of the banding of teeth as a means of support to regulating appliances; which enables one to construct an apparatus that can in most instances be permanently attached to the teeth from the beginning to the end of the operation; that will possess proper machinery for delivering the force in amount and quality directed and controlled throughout all the processes of change in exact accord with physiological requirements; and finally to possess means for holding the teeth until they are permanent in their new and regular positions.

It is unfortunate, however, that our literature in this department is far from complete, judging from the most modern publications; and will continue to be so as long as text-books upon orthodontia ignore as a prime factor to the beginning of every work, the principles of philosophy of force in all its relations to this subject. For if anything is true, the whole subject from a mechanical standpoint of correcting malposed teeth, resolves itself into a question of ways and means for the utilization of force—its application, transmission, distribution and management along lines of contact and resistance.

Nearly all the literature upon this branch of the subject deals with specifics rather than principles, and consists largely in a vast number of histories of cases in practice, with the particular method of treatment so emphasized by the author that a novice would imagine that there was no other way than the one described—whereas there may have been a number of even better ways.

We are all more or less influenced in our professional lives by others who perhaps have made a special study of some particular branch, and whose teachings we are glad to accept as a guide in our daily practice; yet in every department there will arise individual peculiarities which demand individual thought and variation of treatment, and what is of peculiar importance in this department:—there are rarely two cases of malposed teeth so alike that each does not demand some peculiar and very important variation in the correcting apparatus. Even where the teeth in some case presented for treatment, seem to be situated in exactly the same position shown in the illustration of a similar case in text-book or periodical, there may be other and equally important conditions—not shown or mentioned by the author—which make the two cases decidedly different, and the method he has successfully used quite impractical for us.

In correcting the positions of malposed teeth, it should never be forgotten that the important and indispensable part of the operation is to so regulate the force that the normal functions and healthful conditions of the teeth and surrounding tissues are preserved, and that nature will permit their movement, physiologically, only so rapid as she is able to take care of the broken down tissue of retrogressive metamorphosis, caused by pressure of the tooth upon the walls of the alveolar socket. The rapidity of the movement will be influenced largely by the age of the patient, and differ as other things differ with people.

The point relative to the application of force may be stated as follows : as soon as the applied force overreaches the possibilities of natural, or physiological, change—the surplus is liable to spend itself in producing some undesired and unlooked for condition. In other words, nature can work only so rapidly, and any attempt to force her beyond her natural powers will result—if not in disaster—certainly in a misdirection and transferal of the force to other parts, which should not, and would not, otherwise be disturbed. For instance, it is not always possible to move the apices of the roots of teeth in the same direction that we are able to move the crowns, and it is usually quite important to avoid moving them in an opposite one.

On account of the relatively hard surface layer of alveolar process, there is always a tendency for it to act as a fulcrum over which the tooth is tipped ; but fortunately, the apical region of bone in which the roots are imbedded usually presents sufficient resistance for it to remain as the true and immovable fulcrum of the lever so long as the force is not increased beyond the powers of absorption in other portions of the socket. The moment this does occur, however, the peripheral surface of the alveolus becomes the fulcrum while the load is delivered at the end of the root in the opposite direction, and in exact proportion to the surplus force. If we admit that the apical portion of the socket—blending, as it often does, with the cortical layers of true bone—presents greater resistance to changing the position of that portion of the root, there can be but one conclusion, viz :—So long as the pressure is kept within physiological bounds, it makes little difference in regard to the length of the arm of the lever, or, in other words, whether the force is applied near the occluding surface of the teeth or at the cervix, providing always that it is not restricted in its action by the method of attaching the appliances. As an illustration, notice the action of the force of an oar in propelling a boat in still water. If only sufficient pressure is used against the oar to permit the water to pass from in front of the slow-moving blade, there will not be sufficient pressure at the fulcrum or oar-lock, to overcome the inertia of the boat; but immediately upon the force being increased above the possibilities of the water to get out of the way, the fulcrum of the lever is transferred to the water and the load of surplus force is delivered at the oar-lock with a movement of the boat.

It must never be forgotten that the exact load or measure of kinetic force used in the movement of a tooth must always be expended in another direction upon a rest or anchorage. It has been the common custom for a great many years of distributing this second force upon a broad surface, by means of a plate where it was received partly upon the jaw and partly upon a number of teeth producing no material change in their position. With modern methods for correcting the position of malposed teeth there is not often a need for an anchorage plate, and there are many reasons for avoiding its use—which it is not necessary for me to mention here. Suffice it to say that the single reason alone of the instability of such anchorage, making it impossible to utilize and properly direct the positive and intermittent force of a screw, would be sufficient to employ other means for this purpose, which are now amply supplied by attaching the appliances to bands permanently cemented upon the teeth. Perhaps the most scientific and important possibility in the utilization and management of force is where two or more malposed teeth are so situated that the force which would otherwise be expended upon a static anchorage for the movement of one, is neutralized and rendered inert, by an equal force for correcing the position of another or others. A single form of this is shown when a wedge, spring, or jack is used to separate two teeth approximal to each other or on opposite sides of the mouth, each requiring the same magnitude of force. But if a proper amount of study were given to every case, and sufficient ingenuity employed in the construction of the apparatus, a vast variety of changes would be found possible, and often with little or no force expended upon teeth other than those required to be moved. The author makes mention of a "jack and traction screw." With this implement the anchorage force used in the movement of one tooth is rendered inert by an equal force expended upon another tooth in an opposite direction. Originally it was intended to move two teeth which were approximal or situated near each other, the one standing within the arch and the other without, both requiring the same magnitude of force to correct their positions. By means of an improvement, if one tooth takes its position now before the other the force can be immediately transferred from it to a static anchorage on the opposite side of the jaw, or to some other tooth requiring the same direction of movement, after which the apparatus can be made to continue its work until the other tooth has been forced to the desired place.

The Dental Review.

COPPER AMALGAM.

By E. Bergstresser, Abilene, Kas.

A study of what is called "local action" in a zinc-copper cell will explain the electro-chemical action that takes place in a tooth cavity containing the ordinary amalgam filling, surrounded by the acid moisture and the low grade dentine that are common in so many mouths. In the zinc-copper cell there is a constant wasting of the zinc, even when the circuit is broken, which is entirely of a local nature so far as the zinc is concerned. The zinc contains impurities of iron, arsenic and other metals. The surface of the zinc is in the Bunsen battery amalgamated, which makes its condition precisely like an amalgam filling; for the impure zinc is practically an alloy. The zinc is at about 1.86 volts potential, while the iron is about 1.55 volts, having a less tendency, therefore, to become oxidised. There is then a latent difference of potential between the particles of zinc and the particles of iron, and when they come in contact on the surface, in the presence of the acid, a current of the electricity flows from the particles of zinc through the acid to the particles of iron; of course this local difference of potential keeps up a steady current that exists, when the battery is opened or closed, and a constant wasting of the zinc ensues.

In an amalgam filling there is a difference in potential between the ingredients because there is no real chemical union, but a mere molecular mixture, the particles of silver, tin, gold, platinum, etc, are all of different potential, and when they come in contact upon the surface of the filling, in the presence of the acid moisture, galvanic action ensues that destroys the easily oxidizable ingredients, such as tin and zinc. Shrinking and bulging are the results in the filling, and at the same time, the acid that accompanies the galvanic action causes dissolution in the lime salts of the dentine. This is not only the theory of Dr. T. Chandler, but it has been shown by Dr. S. B. Palmer, in experiments with the galvanometer, that the surface of an amalgam filling, moistened with an acid is crowded with currents. The formation of a crust of oxides and sulphides upon the surface of a filling polarizes it, and in this way the destructive galvanic action is brought to a halt. How often have we seen old shrunken and stained amalgam fillings, that were keeping a tooth in a tolerable state of preservation, when replaced by a new amalgam filling, the same tooth would crumble away in a few years. In the old filling the galvanic action had ceased, because the particles of different potential upon its surface had become encrusted by a uniform coating of one potential, that had also raised the surrounding dentine to the same potential, by filtering into it. The polarization of the copper in a voltaic cell, by the collection of bubbles of hydrogen upon its surface, thereby stopping the current of the cell, is nearly similar to the polarization of a filling. In the selection of an amalgam filling we should choose for durability one that becomes promptly polarized by the coating of oxides and sulphides. Gold and platinum are therefore not very desirable constituents in an alloy for then oxidization is *nil.*

The filling that becomes the most readily insulated in the cavity by reason of the coating of sulphides, and, therefore, the best tooth preserver, is *copper amalgam.* It has become the popular thing in dental meetings and in journals to abuse this amalgam. The members of the dental, like those of the medical profession, are followers of fads. A few men in each profession of these professions dogmatize and classify for the rest and set for them all the fashions in operating and medication. It has been urged against copper amalgam that it has proved unworthy, for few are now using it that employed it a couple of years ago, when first so extensively introduced. At the same time, it could be held that there must be something wrong with the amalgams previously in use, or they would not have been so universally abandoned at the time.

The union of copper and mercury takes place as a chemical combination and is known as a *binary compound,* i.e., it is made up of molecules. Containing each one atom of mercury and one atom of copper. Heat is evolved in the union of mercury and copper into an amalgam and the action is thus very similar to the union of sulphuric acid and water. Copper being in excess in atomic quantity the molecules of the copper-mercury compound are dissolved in it. The sulphuric acid which is found free in the saliva forms a coating of sulphate of copper on the filling. This coating is soluble in the saliva and is constantly being washed away and then again renewed. This causes the wasting of the filling found so objectionable in many cases. In mouths in which the fillings turn black there is present sulphuretted hydrogen, which changes the coating of sulphate into the black and insoluble sulphide. It is this last change that renders copper amalgam a permanent filling.

The promptness with which the coat of sulphate, or sulphide, forms upon the surface of a copper amalgam filling polarizes it at once and renders it free from the disastrous galvanic action that is so destructive to all other amalgams, which being only mechanical mixtures of metals of different potentials are bound to disintegrate in the presence of the oxidizing acids of the mouth. It has just been stated that a copper amalgam filling will waste unless it becomes coated with the insoluble sulphide This destruction of the filling is in all respects very similar to the dissolution of cement fillings and in no way resembles the bulging and shrinking of the ordinary alloy filling. The antiseptic property of the copper makes it unique among filling materials and places it easily first as a saver of low grade dentine. The one unfortunate thing about copper amalgam is its peculiar wasting in many mouths. There are many of his amalgam fillings that are now badly wasted, and of some that he repaired there was scarcely more than a trace of the original filling, but under these small remnants, the dentine had a flinty hardness, and was excellently preserved, although in some decay had again commenced in the unprotected walls of the cavity. He does not believe decay can exist when the cavity has been properly prepared and the filling correctly manipulated. Another virtue of this filling is its adhesion to the cavity walls. Any one who has tried to dislodge an old copper filling will have observed this. It resembles cement in this respect as it does in other ways. For the last two years he has been using copper amalgam in the following way. The cavity is filled with the copper amalgam until it comes just to the edges of the walls, while the centre is left hollow; finish out the corners of the filling with some good alloy, until it is brought flush to the surface. In this way the virtues of each amalgam can be obtained and the defects of each avoided. The results obtained are the best he has ever had from amalgams and he anticipates a permanence that he does not think otherwise possible. Some alloys, as Flagg's submarine, contain a small part of copper and in this way display the virtues of a copper amalgam filling. But as previously stated, such fillings are mere mechanical mixtures of various metals of different potentials, the individual molecules of which on coming in contact with one another on the surface in the presence of the acids in the saliva, generate myriads of galvanic currents that must act disastrously both on filling and tooth structure.

Time has demonstrated that massive contour gold fillings on frail teeth are unpractical, time has also shown that the indiscriminate banding of teeth, with attachments for bridges is bound to bring disaster to all parties concerned. The previous empirical use of copper amalgam by many has not brought all the beneficient results they had been led to expect.

Every one now knows what are the defects of copper amalgam as they do the effects of gold, or of crown and bridge work. If it is employed as has been explained in this essay, the author feels sure the results will be gratifying. In this way its imperfections are avoided and all its wonderful qualities as a tooth preserver are secured.

Western Dental Journal.

THE DEGENERATION OF HUMAN TEETH ; ITS CAUSE AND ITS CURE.

By J. Leon Williams.

The causes of decay of the teeth are two-fold—predisposing and active, the former being far more important than the latter, inasmuch as the active or immediate causes of disintegration would have hardly more than a potential significance in a perfectly healthy mouth. The predisposing causes cover a field far too broad for exhaustive consideration within the limits at command in this article. They involve all that is pernicious in the artificial condition of modern civilisation, all transgressions of natural laws, and the hereditary consequences of such transgression. The effects of these malign influences may be summed up in the brief expression—*imperfect nutrition,* especially during the period of the formation of the enamel. When the nutrition of the teeth is suddenly arrested, or violently disturbed, as it is by many infantile diseases, such as scarlatina, measles, chicken-pox, convulsions, and rachitis, the effects are often so marked as to be plain to the most casual observer. They are shown by lines of indentations, or pits, extending across the surfaces of the teeth. Sometimes the half of the tooth next the gum will be quite perfect, while the lower half will be rough, pitted, jagged, and frequently entirely denuded of enamel in spots, showing that the teeth were half formed before these violent disturbances of nutrition occurred. But these obvious external aberrations of formation are of much less frequent occurrence than a kind of defectiveness of the interior structure of the enamel which the microscope alone reveals. A tooth which to an untrained observer, or to the unaided eye of an expert, appears perfect in form and structure will often be found, when examined in section under the microscope, to be exceedingly defective. These faults of structure, whatever their character, are always much more serious when they occur on or near the surface of the enamel, for surface faults at once invite attack from those active causes of decay which are always present in the mouth. There are probably also important defects of structure, or molecular relationship, which the microscope does not reveal.

We have seen that defects in tooth structure arise from impoverished or perverted nutrition. Attention has already been called to an antecedent in this connection, to which, we are to look more than to any other for the cause of the present degenerated state of human teeth. When all modifying conditions and circumstances are taken into account we shall always find the poorest tooth structure where the greatest demands are made upon the the nervous energies. No people in the world expend so much nervous energy as the Americans. Nowhere are nervous diseases so prevalent, and nowhere is there so marked a degeneration of the teeth. But this view of the predisposing causes of decay is not based merely upon the world-wide coincident conditions which we observe among all civilised peoples. It rests upon certain chemical, embryological, and physiological relationships between the teeth and the nervous system.

Degeneracy in the structure of the teeth is only one of the conditions inimical to their preservation which nervous excesses produce. Environment is even more important than inherent weakness of structure as a factor in the problem of decay. Teeth of decidedly poor quality would always remain sound in a perfectly healthy mouth. In this fact lies all hope of saving teeth by hygienic measures, as we shall see when we come to the consideration of that matter. Every function of the body is, of course, immediately under the control of the nervous system. Nervous excitement of any kind immediately affects both the quantity and quality of the digestive fluids, including the saliva. The bite of any animal, for instance, inflicted when the brute has been worried into a state of intense anger, is much more likely to prove poisonous than if given when its nervous system is in a more normal state. Some change is wrought in the saliva which favours the rapid development of poisonous micro-organisms. We do not know the exact nature of the change effected in the quality of human saliva by abnormal nerve action, but we do know that the saliva thus changed, becomes favourable to the rapid development of several forms of bacteria, which are the active or immediate causes of decay of the teeth.

To compare the action of mouth bacteria upon the enamel to that of lichens and mosses upon a perfectly polished stone, will convey to the mind of the reader as perfect an illustration as is required of the commencement of the process of decay. If a lichen be lifted from such a stone it will be seen that the polish has been destroyed, and that the vegetable growth has produced a depression on the surface of the rock. Some portion of the surface of the stone has been actually dissolved by the action of the fluids found in the plant. This is precisely what occurs when acid-forming bacteria remain for any considerable length of time in contact with enamel. A slight roughness, amounting to hardly more than a removal of the perfect polish of well-formed enamel, is the first visible effect of the action of these microscopic vegetable cells. If the action be continued a slight depression is formed, which is rapidly deepened into a cavity, and thus the enamel of the tooth is penetrated. Once the dentine or bone of the tooth is reached the process of decay advances much more rapidly. This tissue is everywhere pervaded by a system of microscopic canals called the dentinal tubuli. The bacteria penetrate deeply into these canals, causing rapid enlargement of them and speedy breaking down of the tooth substance. Not only does the acid produced by the fungi dissolve the mineral elements of the tooth, but the micro-organisms also seem to absorb, as food material, the animal matter which fills the dentinal tubuli.—*The New Review.*

A PLEA FOR THE PRESERVATION OF THE NATURAL TEETH.

By W. Pearson, L.D.S., Toronto.

The question is, When is one justified in using the forceps? Is it in the case of the temporary teeth? No, decidedly not; not under any circumstances, until the age of the child indicates that the time for action has arrived, and which is not until the new tooth is ready to take the place of the old one. More harm may be done at this age by premature removal than by delaying too long. Judicious treatment and filling (if possible) is always to be resorted to. In removing these teeth the author has fallen into the habit of operating chiefly with his fingers or by an incidental application of a probe or excavator, and very seldom indeed resorts to forceps, rather preferring to wait until such times as they are not a necessity, and he prefers leaving roots until the full time for the new tooth to appear in a few days after operating. Is it in the case of the sixth year molars that maltreating practices should begin, to do evil that good may come of it? That is his opinion, in a general way, of removing sixth year molars. To make a quotation for the occasion: "To be or not to be, that is the question. Whether it is better to suffer the stings and pains of outraged nature and present troubles, or to take up arms and fly to the evils that we know not of." No dentist is able to determine what is going to be the result of premature extraction of a sixth year molar upon the undeveloped maxillary. The facial derangement is more than he can foresee.

After years of careful observation and study of many cases in regulating by himself and others, where these teeth have been sacrificed and where not, he is strongly convinced that there is an injudicious and wholly unnecessary sacrifice of good teeth here. Once in a while a case is presented where extraction is advisable, but this is the exception, while too many make it the rule.

In the light of present progressive dentistry, we can scarcely be excused in our action if we recommend a resort to extraction, except in cases of badly wasted roots. The author holds a strong prejudice against removing even sound roots, preferring to fill them where they cannot be crowned, and protecting the soft tissue and upholding the alveolus as long as possible. A sound root may be serviceable for years, especially so after treatment and filling or capping.

Looking at the æsthetic effects of removing teeth and restoring by the factory-made article, it is a physical impossibility to reproduce the natural expression to a face when once the roots of the teeth are removed. It cannot be done.

The canine eminence cannot be prolonged on the outside of the maxillary sufficiently high, without interfering with the free action and motion of the lips. As soon as the six anterior teeth are removed, there begins a change in the body of the jaw as well as the alveoli, too high up for any outside artificial contrivances to be placed for the comfort of the patient.

The author thinks it may be possible that this is the reason why his English brethren do not, as a rule, remove the roots in substituting the natural teeth; and, if so, he commends them for their good taste, from an artistic point of view, while from a sanitary or economic point, perhaps there is not much to be said in its favour.

Dominion Dental Journal.

LOCAL PARALYSING ACTION OF COCAINE ON THE NERVES AND NERVE CENTRES.

M. Francois-Franck communicates to the *Archiv. de Physiolog. Norm. et Patholog.* for July, a preliminary paper on results obtained on the above subject after experiments extending over many years. He points out that cocaine suspends the activity of all living tissue elements which have been brought into contact with a sufficient dose. It is a paralysing poison, acting alike on sensory and motor nerve endings, on peripheral nerves of all kinds, on the nerve centres, on muscles, glands, and ciliated epithelium, on leucocytes vegetable protoplasm, microbes, &c. Any nerve belonging to the cerebro-spinal or sympathetic system, can be functionally divided, in a limited zone, by the application to it of a dose of cocaine, varying between 5 and 10 milligrammes, according to the size of the nerve and the mode of application. The production of the paralytic effect is progressive—very rapid after injection within the sheath of the nerve, slower if the cocaine is administered by the application to the spot to be paralysed of gelatinous tabellæ containing the cocaine, or by wrapping the part in wadding saturated with a cocaine solution. The paralysing action is gradual, so that the transition from the normal to the paralysed condition may be observed. The loss of function in a nerve, is for the time being, as complete as if a section had been made, and with proper precautions, does not extend more than one or two centimetres beyond the part in contact with the cocaine. The isolation of organs and nerve centres thus produced, lasts a sufficient length of time to allow detailed study of the paralytic phenomena. Finally, the function of the nerve suppressed by the cocaine is completely restored by the withdrawal and elimination of the drug. Herein lies the advantage of this method of physiological over anatomical section. It permits the survival of animals, of which nerves indispensable to life, such as the phrenics or pneumogastrics, have been functionally divided ; it becomes possible to repeat experiments on the same animals an indefinite number of times ; it allows a comparison of phenomena resulting from the loss of action of certain nerves, and of those depending on their normal activity ; and in the course of an experiment any reaction may be temporarily eliminated which would complicate the result sought for. In fine, the local action of cocaine can be employed where section was previously necessary, and without any ultimate injury to the nerve.

In carrying out this method certain precautions must be attended to. The dose of cocaine should be sufficient to paralyse the nerve locally, but not large enough to give rise to general trouble as a result of absorption. Again the contact of the cocaine should be limited to the nerve that we wish to suppress functionally. M. Francois-Franck supplies numerous hints to guide experimenters on the methods of choice of solutions. Thus, the extent to which the drug has spread may be approximately determined by introducing into the solution used colouring matters which do not affect the tissues.

Nerves affected by cocaine show, in the place, a slight increase of excitability, then a more or less prolonged loss of function, which, gradually disappearing, is followed by a short period of hyper-excitability before the final return to a normal condition.

Tracings are given showing the effect upon respiration and

and blood pressure of local cocainisation of the two vagi of a dog. The change in respiration thus induced by withdrawal of sensory peripheral stimuli is compared and contrasted with that brought about by paralysis of the respiratory centres.

It is, however, in the power of action on small areas of the nerve centres that the most interesting results are obtained. By the application of cocaine to the floor of the fourth ventricle, for example, respiration may be arrested by the paralysing of the central nervous organs presiding over the movements of respiration. The noteworthy point demonstrated by this experiment is that the arrest of respiration is produced by gradual diminution of the extent of the movements, and not by a slowing of them. It seems that the centres regulating the respiratory rhythm escape the paralysing action not because of any resisting power to cocaine, but because they are to be sought higher up than the medulla.

The value of the method for the study of cortical centres can be readily appreciated since by it reflex reactions and central influences may be temporarily suppressed, while surrounding parts are not readily affected as after anatomical section, and the elimination of the drug leads to complete restoration of functional activity.

Glasgow Medical Journal.

Dental News.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the October sittings of the Examiners, the following gentlemen having attended the necessary curriculum of study, and passed the required Examinations, were admitted Licentiates in Dental Surgery :—

David Puton Boyd, Glasgow ; Alfred Thomas Burt, London ; John Matthieson Macmillan, Glasgow.

Three Candidates were referred.

NATIONAL DENTAL HOSPITAL AND COLLEGE.

Sir James Crichton Browne, F.R.S., has consented to preside at the Annual Dinner of this School, to be held next month.

Dental Hospital Reports.

Work done at the Victoria Dental Hospital of Manchester, during the month of July, 1892.

Number of Patients attended . .	968
Number of Extractions . . .	781
Number of Extractions under Anæsthetics . .	147
Gold Stoppings	68
Other Stoppings	139
Miscellaneous	359
Crowns	15
Irregularities	26
Total	1535

Frank L. Tanner, *House Surgeon.*

Statement of Operations performed at the Dental Hospital of London, Leicester Square, during the months of Aug, and Sept., 1892.

		Aug.	Sep.
Extractions	Under 14 . . .	548	444
	Adults . . .	1618	1506
	Nitrous Oxide . . .	1321	1383
Gold Fillings		207	325
Plastic		518	772
Treatment of Irregularities of Teeth— .		49	62
Artificial Crowns		20	20
Miscellaneous Cases . . .		228	276
Total		4509	4788

House Surgeons
Savill H. Hayward,
T. Herbert Clarence,
B. Alfred Castellote.

British Journal of Dental Science.

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THE RESTORATION OF DEFECTIVE TEETH.*

By P. Headridge, L.D.S.I.

I desire to bring to your notice a few points in the manipulation of mineral teeth to make good the defects in the natural ones.

I do not wish to trench upon the honours due to those gentlemen who have given their time to perfecting and demonstrating to the profession the beauties of porcelain inlay work. I want rather to show how with very little trouble the usefulness of the mineral teeth in the market may be increased by grinding them down and fusing new pins into them in any position which one may find to be the most convenient for the case in hand.

The first and simplest case I shall take is where the upper central incisors are deeply pitted owing probably to some disturbances during development. In this case we usually have the cutting edge ragged, thin, and friable, and the whole appearance is often very unsightly.

If we decide to try and mend matters we have three methods open to us.

1. To fill and build up the cutting edge with gold.
2. To destroy the pulps and replace the teeth by pivot-teeth.

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* Read before the Manchester Odontological Society.

3. To put mineral facings on the teeth without destroying the nerve.

If we fill and build up the cutting edge with gold or any other filling material, we can hardly expect to get anything but a most manifestly artificial result.

To devitalize the teeth supposing the pulps are in a perfectly healthy condition appears to me an unnecessary waste of life. Consequently I should prefer to face the teeth with mineral in the following manner :—

The labial surface is first ground off flat without approaching too near the pulp chamber. The sensitiveness of the dentine can be deadened by using the ether spray. In these and similar operations we might perhaps make more use of the spray than is, I believe, the general practice. For grinding down the natural tooth I find that a diamond disc is the most convenient, as well as in the long run the cheapest instrument. After the face of the tooth has been cut off in a slanting direction, high enough to remove all the unsightly pitted enamel and a smooth flat surface obtained, take a plate tooth of the right shade and character. For this purpose it is generally better to select one rather larger than the natural tooth. Cut off the pins and grind the back of the mineral tooth flat and fit it in the mouth so that it restores the natural tooth to its proper shape.

If it happens that the remains of the pins are quite firm in the shell of mineral and come opposite the lateral portions of the natural tooth on either side of the pulp chamber flow enough pure gold on each platinum pin, and file each dot of gold up into a short pin. Now drill two holes in the natural tooth for the two pins to fix into, and fix the mineral shell in its place with some white cement. When the edges have been polished down smooth with the enamel the operation is completed.

It very often happens, however that the remains of the pins are not where one would wish them to be. In this case drill the holes into the natural tooth, and take a piece of platinum wire rather thinner than that used by the makers for the pins of their mineral teeth, and bend it into a flattened U shape so that the two ends will fit into the holes drilled into the natural tooth. Now cut a slot in the mineral with the diamond disc so that the face-piece again fits close to the natural tooth with the wire in position.

The facepiece and wire are now taken out of the mouth and the wire fused into the slot in the mineral with some easily fusible mineral body.

It is often better to try the face-piece in again while the mineral is in its plastic form before fusing as one may thus more easily get the proper adjustment.

The method of putting entirely new pins into the mineral is really less trouble in the end than adding gold pins to the remains of the platinum ones, because by this means the pins are more easily fitted into the holes in the natural tooth.

For fixing the pins into the mineral I have used Putnam's body, but I found that when fused it was too granular. Lately I have been using Rose's Mineral and this I find requires less heat and gives a much better result.

With Parker's gas furnace one can fuse in the pins in a very few minutes. There are two or three specimens here which will no doubt explain matters more clearly than words.

I have employed a method similar to the one just explained for restoring laterals and centrals which have accidentally had the corner or cutting edge broken off without injury to the pulp.

In such cases I grind the cutting edge and the broken surface down so that I get a smooth flat surface slanting towards the lingual wall and exposing an area of sound dentine on either side of the position of the pulp chamber. Now select a mineral tooth as near the character of the natural one as possible, and grind it down so as to leave little more than the incisor edge which is then fitted in the mouth so that the natural tooth and mineral fit squarely into each other. A couple of holes are drilled one at either side into the natural tooth, and pins are fitted into them and then fused into the mineral and the operation completed as before. I need hardly say that in these cases if properly performed there ought to be only the faintest line of cement exposed between mineral and enamel.

I may mention that small pieces of mineral, such as I have been referring to, require very little to hold them permanently and securely in position,consequently, the pins need in no case be more than 1-16th of an inch in length, and often even less than that is amply sufficient.

Small pieces of mineral cut off suitable teeth and held in position by pins which have been fused into them, may of course be made use of in many other cases than the two simple ones I have already mentioned.

For example, where the cutting edge of the incisors has been worn down and the bite must be restored or where we want to build up the anterior corners of molars. We often come across molars which have had the enamel of their grinding surfaces denuded and consequently are much shortened by use, but with their pulp still quite healthy and not in any way exposed. In many cases a gold crown would shew and of course with any of the mineral crowns in the market we would have to destroy the pulp before we could use one of them.

These two difficulties may be overcome by cutting a suitable mineral tooth down and fitting it on to the natural one and then fusing a couple of small pins into it in such a position that they fit into holes which do not approach the pulp chamber and finally fixing in position with cement.

With bicuspids one often feels that the most satisfactory operation would be to put on a gold crown, but is deterred from doing so by the gold showing too much in a position so near the front of the mouth. This objection may be overcome by facing with mineral, but the teeth we have at our command are all too thick, and consequently take up so much room that we could not use one of them without first devitalizing the tooth. If we grind one down and fuse pins into the shell of mineral left we can then make a gold crown with a mineral face which can be put on without destroying the nerve.

Formerly I endeavoured to make pieces of mineral such as I have been describing directly from body and enamel, but found that the shrinkage was usually so great as to interfere with the practicability of the method. In all such operations as I have described mineral commends itself to us from the natural appearance and that no amount of wear has any effect upon it.

Gentlemen, I must apologise, for giving you this paper as a Presidential address, but I thought perhaps these few points might be of interest to you and commend to your notice one more use for mineral teeth, and thus add another to our list of materials employed in conservative Dentistry.

ANÆSTHETICS, THEIR USE AND ABUSE.

By William R. Tuck, L.D.S. Eng., Truro.

It is the common fate of all new discoveries to meet with more or less opposition during the period of their practical demonstration : this adversity of feeling may arise from many causes, ignorance of the compound chemically and medicinally on the one hand, and on the other, a want of knowledge of the temperament or idiosyncrasy of the individual on whom such *experimentum crucis* has to be made.

I have a vivid impression of the time when anæsthetic agents were first introduced ; by many, they were considered a great blessing, by others, a wicked machination and subversion of the natural order tending to produce unhappy results. Chloroform had not been long in use before a fatal case occurred in this county through its administration ; true, it could not have been employed under more unfavovrable circumstances, albeit, the public refused to take this into consideration ; the subject being an old man, greatly reduced by long suffering and pauper fare.

The news of this event was soon circulated far and wide, and much acerbity of feeling aroused in consequence,imaginary vengeance was wreaked on the heads of all concerned in this matter, they being accused of an act little short of murder. So meagre was the knowledge of this new agent at the time that not one of the faculty concerned attempted to defend this, unfortunate mishap or misadventure in any way. At that time, however, I had some experience in the use of anæsthetic elements, especially Sulphuric Ether, which gave me an opportunity to study the nature and action of narcotic influences.

I, therefore, took it upon myself to vindicate the use of what I considered one of the greatest blessings, and as such, worthy of being handed down to posterity. I am not aware that any one thing belonging to this class of therapeutics has escaped my careful observation, experimental trial, and successful use for the last forty years, although, to confess the truth, I do not attribute my success so much to the element employed, as to the thorough examination and preparation of the individual to be operated upon. It occurred to me many years since, that as heat influences chemical affinity, it certainly exercised powerful ascendance over all medicinal agents brought in contact with corporal structures. Holding this view, I commenced the use of the Clinical Thermometer, and for a considerable time past, I have not undertaken to mitigate physical sensibility in any way without first ascertaining the temperature. If normal, well and good; if one or two degrees above that, I consider it unimportant, if however, much below, I administer stimulants, such as Brandy, Whisky, or Comp. Spirits of Ammonia, to raise the Mercury to 98½ F.

This precaution, other circumstances being considered, such as all the senses being kept in abeyance, I found produced favourable results; indeed, I do not think unfavourable consequences could follow. I may add, that when a patient exhibits much excitability or trepidation, I find a good method to quiet the system is, to give 20 or 30 grs. of Potassium Bromide, half-an-hour before commencing the operation ; in this case, one half of the element used, to produce anæsthesia, is usually found sufficient, less time is also taken to induce the desired end.

HOW TO GIVE GAS.

By Thomas Edward Constant, M.R.C.S., L.R.C.P.,
L.D.S., Eng.

(*Concluded from page* 932.)

The direct danger of gas is entirely connected with the respiratory function. Were this fact more fully known we should have fewer patients who are not permitted by their medical adviser to take it in consequence of their having "a weak heart" or "heart disease." It is an extraordinary fact that even well-informed medical practitioners often advise patients with valvular heart lesions to submit to the extraction of teeth without an anæsthetic, and sometimes in their prohibition go so far as to particularise gas as being peculiarly fatal in such cases. It is, however, the respiration that must be watched during administration, and the anæsthetist may rest assured that while that is satisfactory, no danger need be apprehended.

Cessation of respiration is due to two causes. The more frequent is the falling back of the tongue and consequent obstruction of the passage of air to the lungs during inspiration. The other, by far the more serious form, is due to an overdose of the gas, and is true respiratory paralysis.

In the former case dangerous symptoms immediately disappear on pulling forward the tongue and so removing the obstruction.* In the latter, inversion of the patient, when practicable, is the most ready method of restoration. Where that is not practicable, artificial respiration must be resorted to, the patient being immediately placed in a horizontal position, and the tongue pulled well forward.

With the former condition the gas anæsthetist will often be confronted. It can scarcely be regarded as serious, because so easily remedied ; but for the latter, which is much more alarming, he must always be prepared. Symptoms of the latter condition are sufficiently striking to make it unmistakable. To illustrate it I will describe a case within my own experience.

The patient was a boy about ten years of age, for whom a dental surgeon at the Dental Hospital required to extract some teeth when I was house-surgeon there, and, the anæsthetist for the day having left, I undertook the administration of gas. When the face-piece was applied the boy struggled, and, being restrained, commenced crying. After a short time his struggling assumed the form of jactitation, and I should have ceased giving gas had it not been for the fact that the crying continued and did not alter in character, as it almost invariably does when the patient is fully anæsthetised. Suddenly, however, it ceased altogether, as did respiration, and the pulse at the same time became perceptibly feebler. Complete and general muscular relaxation was coincident with the cessation of respiration, and the boy's face was very livid, the eyes fixed and staring. His tongue was immediately pulled forward and pressure made upon the chest to excite respiratory movements, but without effect. He was then inverted, but it was fully a minute before respiration was re-established, when the teeth were extracted, and the patient recovered completely without having experienced any pain.

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* It is questionable whether the action of drawing forward the tongue relieves the condition for which it is employed by raising the base of that organ and the epi-glottis. As a corollary to this, it is open to doubt whether the symptoms described as due to "the falling back of the tongue" invariably arise from that cause. But, as the treatment indicated (together with pressure upon the thoracic walls, when necessary) is the readiest method of relieving the urgency of the symptoms of respiratory embarrassment, for the purposes of a brief and practical treatise, like the present, it may be assumed that such is really the case.—T. E. C.

From this it is at once seen that this form of respiratory failure is quite different from that occasioned by obstruction, where convulsive but intermittent efforts at respiration are made.

To return to the description of the method of administration. The face-piece being applied to the exclusion of air, the following phenomena are noticeable in the majority of cases. At the commencement of inhalation, particularly if the patient be of a nervous temperament, respiration may be somewhat irregular, but soon becomes even, although slightly more rapid than normal. As anæsthesia supervenes, the respiratory movements become more marked, the breathing becoming stertorous. Circulation, as indicated by the pulse, is little altered—and here it may not be unnecessary to mention that the temporal artery is as good an index as the radial, and far more accessible to the anæsthetist. Should the patient's face exhibit well marked capillaries, cyanosis becomes rapidly evident, and is often extreme. Then comes jactitation, the facial muscles often twitching concurrently, and generally at this point the conjunctival reflex is lost. Most of these symptoms manifest themselves within a minute of the commencement of the administration, and the last mentioned indicate the advisability of its termination. Quickly laying aside the face-piece upon a chair placed conveniently for that purpose, the anæsthetist steadies the head of the patient for the dentist; and, although the means by which he may now be of service are innumerable, a few will suffice to illustrate their general character. Firstly, by altering the position of the patient's head according to the position of the tooth to be extracted, he renders it more accessible to the dentist. For instance, supposing it is intended to extract a left lower and right upper bicuspid, the dentist would probably extract first the left lower bicuspid, when he would prefer the chin of the patient to be depressed, and then would like the head of the patient extended during the extraction of the upper tooth.

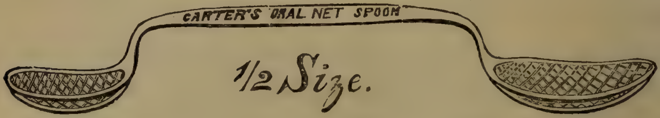

Fig. 6.

Occasionally, a patient at the commencement of the operation stiffens out into a position amounting to opisthotonos. If, during this, the anæsthetist holds the head firmly against the head-rest of the chair, the dentist will be but little disturbed by this demonstration. But perhaps the most important of his duties at this time is to prevent any tooth or root that may slip from the forceps from falling into the air passages. This is most likely to occur when the head is extended during the extraction of roots in the upper jaw, and the best method of preventing it in this case is by using an oral net-spoon. (See Fig. 6.) This should be held in the left hand when the roots to be extracted are on the right side, and *vice versa*, and should be placed in the mouth and held in such a position that anything dropping from the forceps may be caught by it. Great care should be taken that it should not be in the way of the operator nor obstruct his view. Where lower teeth are extracted and the chin depressed there is not so much danger. At the same time no tooth should be left loose in the mouth ; and if, as not unfrequently happens with lower bicuspids, one should shoot up between the blades of the forceps, it must be removed before the operation is proceeded with, particularly if upper teeth are next to be extracted, as the head will then be extended. If, however, the anæsthetist can *safely* secure it in the sulcus of the cheek with his finger, the operator may proceed, and less time be lost than if he were delayed while the tooth was removed entirely from the mouth.

Should a tooth or foreign body of any description fall into the larynx in spite of the precautions here mentioned (quite a possible, but fortunately hitherto rare accident) and spasm of the glottis ensue, if inversion of the patient be impracticable or ineffectual, laryngotomy should be at once performed. No one should undertake to give gas for operations in the mouth unless fully prepared to perform laryngotomy or tracheotomy in event of either becoming necessary; and he should, moreover, have within reach the instruments necessary for such emergency. Any neglect of this precaution deserves the severest censure.

This matter, in my opinion, should constitute the criterion by which the disputed question as to who is qualified to give gas ought to be decided. No one should take upon himself to administer any anæsthetic unless morally and legally qualified to bear any responsibility contingent upon such undertaking.

In cases where the anæsthetist can be of no more direct service to the dentist, he can, while steadying the head, prolong the anæsthesia to a certain extent by compressing the nostrils of the patient as soon as the face-piece is removed. This effects its object by limiting the amount of air inhaled; and, in order to afford the dentist longer time where there are a number of extractions to be made, or a difficult tooth to be removed, he may even go so far as to completely exclude air by pushing back the tongue when the patient is on the point of recovery, the few seconds thus gained being invaluable to the operator.

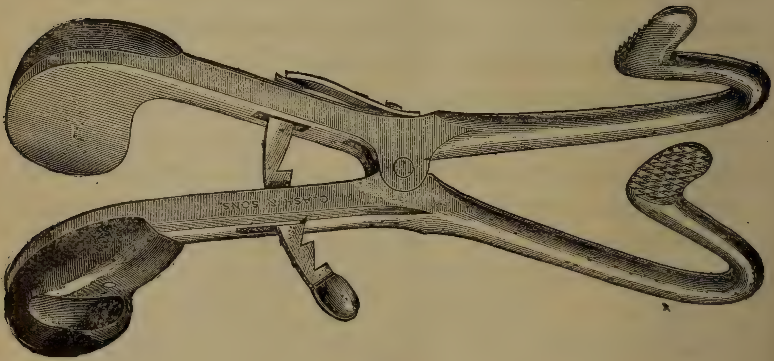

Fig. 7.

When teeth on both sides have to be extracted, and are so far back in the mouth that the gag cannot be placed beyond them, the anæsthetist must be prepared to insert a Mason's gag on the side on which the dentist first operates as soon as it is cleared. This should be done without loss of time, the previous prop being removed as soon as the mouth is sufficiently widely opened to admit of its being taken away without the exercise of undue force. This should not take longer than the time occupied by the dentist in changing his forceps.

The recent improvement in Mason's gag suggested by Dr. Buxton is very useful, as it ensures its expeditious adjustment. The difference between this and the old form is that the ratchet bar admits of the gag being worked with one hand—this will be seen by reference to Fig. 7.

Should the prop (placed in the mouth before the administration) slip, it would become necessary to force open the patient's mouth immediately the face-piece is removed. This is sometimes a difficult matter, and cannot be done with a Mason's gag when the teeth are firmly clenched, because its blunt ends cannot be inserted between them. For this pur- the tongue forceps suggested by Mr. Braine are particularly useful, as they are made strong enough to be of service in such an emergency, the pointed ends being easily forced in between the teeth. Tongue forceps are, of course, indispensable instruments, and use of the pattern here recommended obviates the necessity for the employment of a special mouth-opener.

Prevention, however, is proverbially better than cure, and very little extra care in the adjustment of the prop previously to administration saves much trouble subsequently. Indeed, it occasionally may happen that it is impossible to open a patient's mouth until too late to operate, in consequence of consciousness having been recovered : and here a word must be said in reference to the danger of re-administration of gas in such cases.

The recorded instances of death during the administration of nitrous oxide show that in those where the fatal issue was directly due to the gas it had been re-administered. Without discussing the physiological action of the anæsthetic in question, a matter quite beyond the purpose of the present paper, it may be stated that for some time after patients have been ully brought under its influence their susceptibility to it is markedly increased. So much so, that when re-adminstered the narcosis produced often deepens considerably after the removal of the face-piece, and I have known respiration to cease when sufficient time had elapsed to have allowed a patient to whom it had only been once administered to regain consciousness.

Although I have thus far only given a general indication of the manner in which the anæsthetist may be of service to the dentist, sufficient has been written to show how really valuable his assistance may be.

When recovering from the gas patients are sometimes very violent, particularly alcoholic subjects, striking out with their fists and even springing up from the chair before they are fully conscious. As most dentists' chairs are very near a window, this latter action may be particularly dangerous, as it is not impossible that he may precipitate himself through it, for I have known an instance where one was broken, although the patient did not actually fall through. The best way of coping with this demonstration, as soon as the patient exhibits any indication of it, is to lay firm hold upon his coat collar at the back, having the right arm hooked behind the head-rest of the chair. In this manner the patient is aware of no restraint unless he actually attempts to stand up, but, if he should attempt this, the anæsthetist, aided by the weight of the chair, has no difficulty in preventing him, at the same time being in a safe position should his charge become violent under the restraint.

Any attempt on the part of a patient to grasp the hand of the dentist during the operation is best obviated by seeing that the hands are placed together with the fingers interlaced at the commencement of the administration. Although even when unconscious the patient's acts may be sufficiently purposive to enable him to hinder the operator if the hands be left free, yet when the fingers have been interlaced when anæsthesia has been induced I have never known them to be disengaged until the patient was fully conscious.

It should here be stated that although such manifestations will now and then occur even when gas is administered by professed anæsthetists, yet, as a general rule, the more experienced the administrator the less frequently are they exhibited.

The return to consciousness should be as placid and gentle as the awakening from natural sleep; and just as a sudden and rude arousal from the latter condition is unpleasant and alarming, so with the former anything that tends to render one too suddenly conscious is likely to occasion some vague sense of an indefinable horror, not lessened by the strangeness of the surroundings. Therefore perfect quiet should be observed during the interval in which the patient is regaining consciousness, an interval which is far shorter than that where either ether or chloroform is employed. Such practices as sprinkling water upon the face, slapping the hands and like measures are to be strongly deprecated. Hysterical patients sometimes refuse to exhibit any sign of returning consciousness for quite a long time after they are fully recovered ; and to betray anxiety as to their condition by adopting any of the methods here condemned is the most likely way of encouraging them to persevere in their deception. For such cases as ready a mode as any of bringing them to their senses in the fullest acceptation of the phrase is to remind them of the danger likely to accrue to their dress from the blood due to the operation.

Another thing to be avoided is the removal of the prop while the patients are semi-conscious. It is likely to give them the feeling that the operation is not quite terminated, an impression that no amount of reasoning afterwards will eradicate ; in fact, they may even persuade themselves that they experienced pain. For this reason, therefore, when the operation is concluded perfect silence should be maintained and the patient left undisturbed until complete recovery has taken place. Then such little attentions as spraying eau-de-cologne upon the hands, &c., can with advantage be adopted, and are generally greatly appreciated.

In fact, any endeavour on the part of the anæsthetist or dentist to add to the comfort of the patient at such a time is always gratefully received and highly regarded, and does much to place in the category of pleasant experiences what might otherwise be regarded in the light of a dreaded ordeal.

APPROXIMAL CAVITIES.

By R. Ottolengui, M.D.S.

Of all cavities, those in the approximal surfaces usually demand the greatest skill and care. Situated most often in a position inaccessible because of the contiguity of the adjacent tooth, a spreading, or separation of the teeth, becomes necessary. Even after this is done, it not infrequently occurs that what would be an easy filling with ready access, becomes exceedingly difficult because of lack of space in which to work. Add to this the tenderness caused by any system of wedging, and approximal cavities become, of all, the most to be dreaded by patient and operator. They usually have their initiation at the point of contact. Two teeth touch each other at a limited area, and caries begins at that spot. After spreading the teeth, and removing stains, there is seen at this point of contact a whitish, or chalky appearance to the enamel. Except in its most incipient form, it is futile to attempt to remove this by filing or by polishing. The caries usually penetrates very deep in proportion to its circumferential area, and the dentine is swiftly reached. To eradicate the caries with the file or disk would be to expose the dentine, and at all events to destroy the integrity of the abutments of the arch by producing a space, which is almost always mischievous. The best plan is to accept the condition, as a cavity needing a gold filling.

The Dental Cosmos.

British Journal of Dental Science.

LONDON, NOV. 1st, 1892.

UNREGISTERED PRACTITIONERS.

The relation of the State to the Individuals composing it is, naturally, a large subject, and the enactment of the laws upon the Statute Book is open to discussion and difference of opinion by those subject to them. Upon some points, however, the provisions made, seem easy of comprehension. For much the same reason that Society determines to try and protect itself against the ordinary criminal, by ordaining punishment of guilt, so it has appeared right to endeavour to protect Life, by securing that all those who are legally recognised as claiming the power to assist their fellow creatures to combat the attacks of Disease, shall give proof that they are, by previous training and examination, specially fitted for such a responsibility. But here the comparison ends. For, although in both cases the Community desires protection, it is only in the first instance quoted that the State makes fit provision for carrying its commands into effect; in the second case, the absence of an analogue to the police force, renders the behests of Medical and Dental Acts nugatory and of none effect. True, there is something approaching a Judgment Seat, but the composite body occupying it is concerned principally with arranging for the Education and discipline of qualified practitioners, and when one of these is occasionally condemned as an offender, he is not declared unskilful in his craft, but unworthy any longer to rank with his former brethren upon the Register.

These reflections are forced home upon us by reading what took place at a meeting of the Council of the Medical Defence Union. Amongst the cases considered, was that of an unqualified practitioner, who signed a death certificate as L.R.C.P., and S. Edinburgh. The matter was reported to the Registrar of the Boards, who replied that the Colleges had no power to prosecute. The matter was then laid before the Registrar-General, but he replied that the offence took place too long ago (December 28th, 1891) to allow him to undertake a prosecution. One is forced to the sad conclusion, that some kind of State prosecutor for such cases has become necessary (with perhaps an assistant having the functions of an executioner to carry out the decrees obtained), although at present it appears too much to suppose that Public Opinion will sanction, much less demand, such appointments. Probably, the national conscience will not be fully roused until the facts are brought out more forcibly than by the observations made by Coroners' juries from time to time. These metaphorical whispers do no more than render the sleep of Indifference very slightly uneasy.

So much for the public polity point of view. In so far as the professional aspect can be disassociated from the national welfare, it may be well to consider what hope can be held out to honourable practitioners that, as a Body, they may be freed from the discredit wrought by unregistered men. Of course, as Individuals, they can rely upon the good work which they themselves do. An opinion has been recently expressed that an unqualified person may employ a qualified assistant to carry on a practice for his (the employer's) profit without breaking any law, so long as he does not hold *himself* out as being qualified to practise, and this form of "sweating" is perhaps not unknown in dental practice. Unregistered dental practitioners may be divided into two classes. In the first, the Act is avoided by not using the title dentist; there is no pretence of being specially qualified and no attempt is made to take "cover." In the second, the attitude is different, and can only be taken by the help of registered men, who, unfortunately, are to be found as the proverbial black sheep. The latter class of irregular practitioner adopts one of two methods ; either he assumes the head of affairs and employs a registered man as assistant, or the unregistered does the work under the ægis of a registered practitioner, absent in body, and present merely in name. Of course, the *bona-fide* assistant does not enter into the present question, but in each of the arrangements cited, the unregistered man is "covered" by the black sheep, and is enabled to stand in relationship to, and act for, an ignorant Public, as if he were fully qualified. With regard to the first class, we believe that the efficacy of the Dentists' Act has not yet been put to a sufficient test, and there is reason to believe that clause 3, may be found some day to do for the Dental Profession, what the Veterinary Surgeons' Act is now doing for Veterinary Practitioners. It is true that a proposal to form an Association for the Enforcement of Medical Law, has just been made in the *Lancet*, by Mr. SEWILL, who suggests that fifty members of the profession should subscribe, say £100 each, at once, to a guarantee fund, but it is not intended to deal with unqualified individuals, who, under no false pretence, may be practising for gain in any department of medicine or surgery. However, such a proceeding would form an excellent experiment to profit by.

On the other hand, where the black sheep are concerned, it is to the General Medical Council that the honourable practitioner must look, for that Body certainly has the power, and we hope the inclination, to suppress the disgrace known as " covering."

A GRATEFUL PATIENT.—Hospital officers are, perhaps, more often in receipt of complaints from patients than " testimonials," and the following from " A grateful acknowledge-er of so great a boon," recently received by the Secretary of a Dental Hospital, forms a pleasant exception.

Dear Sir, I have enclosed a small donation, one shilling, towards the funds for the Hospital. It is a very small amount, but being in rather poor circumstances I cannot give more. I was there last Thursday, and had two teeth out with gas. I must say that if I had paid a guinea I could not have received better attention, although I only came with a letter given me through a gentleman, a subscriber to your funds. I wished to say too, how very grateful I feel, knowing there is such a place where such thorough attention and great success is shown for the poorer class. Everything seems done in such a manner that no one could complain, unless they were very ungrateful indeed. I hope you will excuse this liberty, but I feel so grateful that there is such a place, and seemingly such very sincere Medical men to carry on the operations so much needed in these later days. If I had the means I would subscribe very largely indeed."

DOCTORS AND DENTISTS.—We have before pointed out that the attitude of medical men towards dental practitioners frequently leaves much to be desired, and that such conduct as meeting unregistered men on professional terms, generally arises from ignorance. We have recently heard of a case in which the action of medical men deserves commendation. The question having arisen in an English town, as to whether a certain person practising dentistry, was a registered man, the Dentists' Register was consulted, and, as the name did not appear, the medical men met together and agreed that none of them must act in a professional capacity in association with such person. It seems that there were some searchings of mind as to what should be said in refusing to "give gas" to such of their own patients as might wish to employ the unregistered practitioner. The action in the following case seems to require some explanation. A dentist's lady patient, under the care of a medical specialist, writes to the former to express her thanks and satisfaction for his past treatment, but, as her medical man insists upon it, she is going the following day to see a "doctor dentist," whom he recommends.

FUNNY LEGISLATION.—Under this heading an account appears, in the *Dominion Dental Journal*, of a peculiarly refreshing attempt, upon the part of a would-be dentist, to get registered by a special Act of Parliament. Fortunately, arrangements were made to contradict the assertions contained in the proposed Bill, and although every possible misrepresentation had been made by the applicant to the press, and to every individual member of the Legislature, he was obliged to admit to the Committee that the statements in his Bill were not true. The evidence of Dr. Beers, the President of the Dental Board of Quebec, appears to have had much to do with the Bill being unanimously and indignantly thrown out.

NEURALGIA.—In the Museum of our College at Philadelphia is the skull of a man who suffered untold agony from neuralgia affecting all the branches of the right trifacial nerve. No diagnosis was reached, nor was any one of the multitude of agents administered for his relief of the slightest service. Post-mortem examination revealed a spicula of bone growing from the border of the oval foramen and piercing the nerve. This case may well be set down as the twentieth cause of a circle to be considered—a circle of jaw pains the first factor of which we shall assume to be a tooth decayed to an extent that exposes its pulp. The latter is simplicity itself; the former is identical with obscurity. To be able to know or to diagnosticate any pain in or about the jaws is one with knowing about all the possible factors. Who of us are so wise?

J. E. Garretson, M.D.

Abstracts of British & Foreign Journals.

NAMES, DEFINITIONS, AND CLASSIFICATIONS.

By Jonathan Hutchinson, F.R.C.S., F.R.S.

It is precisely because great advance has been made in all departments of our knowledge as to the nature of disease that reforms in reference to the names which we employ have become needed. We have outgrown the nomenclature of our forefathers. It would be strange if it were not so. If the few and simple names which sufficed to express the diagnostic achievements of a century ago were sufficient for us now, the fact would imply disgrace. In every department of natural history, new species have been discovered, and new names devised for them. The number of the species of flowering plants, which have now been discriminated and have received distinctive names, amounts to 110,000. For the multiform manifestations of the results of the innumerable influences which combine together to evoke disease in man, our names are probably not in the proportion of 1 per cent. The surgeon who confines his attention to fractures and dislocations, aneurysm, hernia, and a few other cognate subjects, may easily get along with the present system. His subjects of investigation are, to a large extent, mechanical and almost wholly and strictly local. It is not a matter of any great difficulty to name, describe, and classify them. So, too, may the physician of the older school, who is content with his phthisis, bronchitis, and pneumonia, his albuminuria, diabetes, and gout. So, too, may the specialist make himself happy in the success of his iridectomies and his cataract extractions, and take very legitimate pleasure in the accuracy with which he can rectify by lenses defects in the configuration of the eyeball.

Let us not for one moment underrate the importance of these every-day achievements, or of that common knowledge of common things, which is a *sine qua non* to all of us. Our concern is rather to assert strongly that as soon as the specialist attempts to transcend his specialism, as soon as the physician or surgeon tries to get out of routine, and makes the attempt to understand not alone some, but all the problems of pathogenesis which are brought before him, so soon will each and all find themselves cramped and hindered by our narrow and conventional systems of nomenclature and our fragmentary classifications. This is the experience of all clinical workers. Ask the neurologist whether such names as tabes dorsalis, and epilepsy, do not now each include a number of separate maladies which require separate grouping. Ask the physician whether he is content with the terms "diabetes" and "hysteria," whilst respecting dermatology, Mr. Hutchinson's own opinion is that there are at least twenty maladies classed under the name of lupus which require to be discriminated, and, putting all these aside, some five or six different types of "tuberculosis of the skin."

Nothing can be more obvious than that names, definitions, and classifications are far more difficult in our department of natural observation than in any other. If "species," "genus," and the like in zoology have become in the light of modern discovery words which we must understand with some mental reserve, they yet retain, to a large extent, their old limitary meanings, and are themselves capable of definition. In our special pursuits, however, such words have only an exceedingly restricted use. Few, indeed, are the forms of disease respecting which we can say, "This malady is *sui generis.*" The clumsy, but still indispensable expressions "substantive disease" and "morbid entity," employed as implying that the phenomena so denominated stand alone and complete in themselves, and are in relation with one single cause, are probably in use amongst us far oftener than sound knowledge of the facts would justify. The more we know, indeed, the less are we inclined to admit respecting any given disease that it is substantive and self-complete. For the most part in studying disease, we have to deal with most complicated phenomena and with an almost inextricable interlacement of varied causation. Even in what appear to be the simplest of our problems, such, for instance, as the introduction of a specific poison into the system, we have to remember that one partner in the so-called disease, is the living body of the patient, and that no two cases are exactly alike. But the fact that definitions and classifications are in the case of medical pursuits, immeasurably more difficult than in most other branches of knowledge, does not make them of any the less importance. An orderly arrangement of the materials before us is the first requisite to success in the pursuit of further discoveries; and just as an adequate vocabulary must of necessity precede the making of definitions, so must carefully studied definitions precede any attempt at classification which will not necessarily result in error.

The author protests against that idleness of mind which is content to go on using words to which no definite meanings have ever been assigned, and to abstain from attempts at natural classification, merely because they are difficult. A distinction must be drawn between a description and a definition. The former takes cognisance of the outward appearances of the disease described, and may be developed in much detail; the latter should be concise and whilst seizing upon essential features, should exclude all that is extraneous. A good description should neglect nothing which may help to identification, whereas, a definition may be very good, yet, from the fact that it concerns itself rather with abstract qualities, may give but little immediate aid towards the recognition of the thing defined. A description is a not difficult achievement to any good observer; a definition demands much thought as well as observation. A definition may often include many related objects, each of which would require a separate description. Take the names of three common diseases and try to define them, and at the same time to show how their definitions affect their position in any system of classification founded on natural affinities. Phagedæna, erysipelas, and diptheria, are words in common use, and yet there is considerable difference of opinion as to how they should be defined, and as to where the diseases which they designate, should be placed.

Respecting phagedæna, it may perhaps be said that it is not the name for a disease, but rather for a certain condition occasionally assumed by the inflammatory process. Yet assume that between simple phagedæna, sloughing phagedæna, and hospital gangrene, there is no difference of kind, but only of degree of severity—that hospital gangrene is simply phagedæna, having become epidemic in a hospital containing patients affected with wounds. Assume, also, what is exceedingly probable, that the gangrenous affections which attack the mouths and genitals of young children, and which are known as noma and cancrum oris, are really of a closely similar nature, though of a more severe type, with the phagedæna which we so often encounter in syphilis. These data being granted, we have first to note that it is undoubted that cancrum oris, noma, and syphilitic phagedæna may begin quite independently of contagion. It is, therefore, not a specific malady in the sense of being dependent upon the implantation of a specific virus. Next, we must record that, although these inflammations may occur to persons seemingly in robust health, they are almost invariably those who have suffered from syphilis, or, in the case of noma and its congener, recently passed through a specific fever, measles, variola, whooping-cough. With somewhat more hesitation, another asertion may be made, that the use of mercury has often preceded, not only the syphilitic forms, but also those seen in children. We come, then, to the definition of phagedæna as a locally destructive form of inflammation, which attacks sores and wounds, which varies much in severity in different cases, and which occurs for the most part in those who have recently suffered from some specific disease. To this must be added the important proposition that, although capable of spontaneous origin under the conditions mentioned, it is infective to adjacent parts, and may become contagious to other patients with open wounds. We abstain from any description of a phagedænic wound, for the appearances may differ very widely in different cases. For classification purposes we have enough. Phagedæna is not to rank with the specific fevers, although it may become epidemic ; it is a type form of specialised inflammation, occuring under certain known conditions of predisposition.

The term erysipelas is suggestive of controversy. For long there have been two schools of opinion ; the one regarding it is a specific fever, and classing it with the exanthems ; the other ranking it only as a specialised form of inflammation. The difference is very important. The philosophic Dr. Hirsch has ranged himself with the latter, and defines erysipelas as "an infective inflammation-disease of the skin or of one of the mucous membranes," etc., and speaks of "the infective fever which accompanies the local process," On the other hand, most recent English authorities prefer to regard it as an exanthem. The facts which oppose this claim appear to the author to be definite and conclusive. When erysipelas attacks a wound, its development is always local, and the constitutional disturbance is in ratio with the extent of surface involved. It may develop without any appreciable incubation stage, and it may be cut short at any period by suitable local treatment. Its duration is not uniform, but may be indefinitely protracted. One attack does not prevent a second, but, on the contrary, predisposes to others. Thus, then, we come easily to the conclusion that erysipelas is a name for a form of inflammation presenting peculiar features, very infectious to the tissues (the lymph spaces) of the patient, easily spreading by contagion to the wounds of others, and of which one attack leaves proclivity to a second. We have to add to this, however—unless, in contradiction of all probability, we insist that medical and traumatic erysipelas are two different things—that it is capable of origin from exposure to cold and without either wound or contagion. Erysipelas is, it will be seen, placed, according to this definition, by the side of phagedæna, and just as it would be more correct to speak of phagedænic inflammation rather than of phagedæna, so it would be better to use the expression "erysipelatous inflammation" rather than erysipelas, since the latter is too suggestive of a substantive disease which always runs the same course and always presents the same conditions.

Let us now see how the case stands with diphtheria. It is interesting to note that this name has been substituted for what was not improbably a far more correct one—diphtheritis. What is there to hinder us from defining this affection as a contagious inflammation of mucous surfaces, and chiefly of the throat, frequently attended by the formation of pellicles infective by continuity in the patient, and easily spreading by contagion to others? It would surely be wrong to make the formation of the diphtheritic false membrane a part of the definition, for when the disease passes by contagion through a household there are always some cases which show very little membrane, and often a few in which there is none at all. We do violence to probable truth if we deny that these latter are diphtheritic cases, for they originate from contagion from those which undoubtedly are such. The medical officers of those metropolitan asylums which receive fever and diphtheria cases always in their reports count a certain number of cases sent to them as "errors in diagnosis," and of these a certain number are "non-specific sore throats" sent in as "diphtheria." This is surely rather hard upon those who send them. It is to make the diagnosis of a disease depend, not upon it origin, but upon the degree of severity with which it develops certain peculiar phenomena which are common, but not invariable. No man attending a number of patients with sore throats in a house with diphtheria can possibly tell which will develop extensive membranes and which may have none.

There are other important facts which ought to be taken into consideration in the definition of diphtheria. It is quite impossible to distinguish the sporadic cases of membranous croup from those of epidemic diphtheria, and admitting--as we must—that they are exactly the same, we are almost forced to conclude that a disease which becomes contagious may originate independently of contagion and in connection with exposure to cold and damp. In these points the facts as to diphtheria are exactly parallel with those as to erysipelas and phagedæna. All three occur sporadically and in connection with individual proclivity rather than specific influences, yet all may become contagious, prevail as epidemics, and when they do so keep close to type.

The construction of a good definition is a most difficult achievement. Here, if anywhere, we need the light of many minds, and if medical writers could be induced to preface their works with concise definitions of those names of disease which they employ, it would save them from much obscurity of diction and greatly advantage their readers.

The Invention of New Names.—It is mainly in reference to very rare maladies that the invention of new names is required. It is not to be expected that in the present day any common maladies will be discovered which our predecessors had wholly overlooked. It may be truthfully alleged, however, that the rare maladies, although rare, are for their illustrative value, of extreme importance, and they ought, as promptly as possible, to become objects of general knowledge. It may further be asserted, as regards common and well-known diseases, that there are a host of varieties which, were it practicable, are well worthy of distinctive recognition. The clinical investigator who sets himself resolutely to observe in detail and to classify with accuracy, soon finds him at a loss for distinctive names for different groups of cases. To refuse him the privilege of a detailed nomenclature is as absurd as to insist that the ornithologist shall call all birds of prey, either hawks or owls. It becomes, therefore, of much importance to find out the most convenient method of giving names, what kind of names are the easiest to use and to remember and the least liable to suggest error. New names of some kind we must have ; they are absolutely essential to progress.

If, then, we revert to the proposition that names for new diseases, or new varieties, or combinations of symptoms should be selected solely with a view to the convenience of the profession, a few simple rules may be laid down. Such names should (1) be short and easily remembered ; (2) they should be in the vernacular ; (3) they should be available from the very beginning, and such as the observer himself may without indecorum apply ; (4) they should have in themselves no meaning, the reader being left to find that out by reference to the writings of the observer who first named them.

British Medical Journal.

THE COHESIVE PROPERTY OF GOLD.

By S. H. Guilford, D.D.S., Philadelphia.

Gold, while possessing most of the physical characteristics common to metals, possesses certain ones in a very marked degree. Among these may be mentioned especially malleability and ductility. In the former it stands pre-eminent, while in the latter it is excelled by but one or two metals. Its possession of these two properties in so great a degree, renders it useful above all other metals for dental manipulation, while its further property of insolubility in any of the pure acids, whether vegetable or mineral, makes it especially suitable to be placed in the human mouth.

Another property which it possesses to a remarkable extent, is softness, although this is implied by the previously mentioned properties, for no metal could be malleable and ductile to the extent that gold is without being exceedingly soft.

Malleability and ductility are in all cases due to, and dependent upon, cohesion, which may be defined as that force which binds and holds together the ultimate constituents or particles of any solid.

Gold in its pure state possesses this property to such an extent, that two masses of it, under suitable conditions, may be as perfectly united in their cold state, as they could be if fused by the aid of heat.

How is this perfect union brought about? Either one of two theories will account for it. One, the molecular theory, holds that while the attraction of cohesion operates upon all solid bodies, its operation is only sensible at insensible distances. When, therefore, the molecules of the same body, or of two similar bodies, are brought within the sphere of this attraction, cohesion takes place. The other, which for want of a better name, we may call the dynamic theory, holds that the molecules of a mass or masses of matter are held together by being interlocked with one another, either naturally, or by being compelled to assume such a relation under the influence of pressure.

It would seem as though, in the instance cited, both the molecular and dynamic forces operated to produce the result, for union between the metals will not take place unless they are brought into the closest possible apposition, nor will it result if the metals have been hammered or rolled and not subsequently annealed. When a nugget or ingot of gold is subjected to pressure its bulk is sensibly reduced, but when heated to a point slightly below fusion its original dimensions are restored. This latter process is known as annealing. So, also, when a mass of gold is beaten or rolled, it assumes a condition of stiffness and intractability, but its original softness and plasticity are completely restored by annealing. These changes in the mass are explained by the universally conceded fact, that under the influence of pressure, the molecules are driven into closer proximity than is natural to them, and that heat, by expanding the mass, allows the particles to move slightly among themselves, and resume, as nearly as may be, their former relations to one another. Gold, after being beaten into foil, is always annealed in order to restore to it the softness which has been lost in the process of hammering. It also restores its cohesiveness. When it is desired to modify this cohesiveness, the foil is simply exposed to the air for a time, and thus converted into the quality known to us as semi-cohesive. During such exposure, the gold probably attracts and attaches to itself minute particles of matter, which are always found floating in the air. It is also probable that there is a condensation upon its surface of certain adventitious gases and vapours. In this way the surface becomes coated with a layer of foreign substances which modifies, and would in time entirely destroy, its natural property of cohesion. Some manufacturers of gold foil have a method of rendering it non-cohesive without exposure, and claim that, while in this condition it is as pure as the cohesive, it cannot, like other preparations of foil, be made cohesive by annealing.

The process of imparting this property to pure gold is kept a secret by the few who understand it. Truly non-cohesive gold possesses the quality of softness or pliability in a remarkable degree. This it could not have without the final annealing after beating, which, in restoring the softness, would also re-establish its cohesiveness. It is therefore reasonable to suppose that it is again deprived of its cohesiveness by some subsequent treatment that causes its surface to be overlaid with a film of such character as not to be readily dispelled or driven off by heat. Treating it with a solution of ferrous sulphate, or exposing it to the vapours of sulphate of phosphorus, would probably produce this result, but just what process is employed we cannot say. That the treatment employed in rendering foil non-cohesive is surface treatment is shown by the fact that when two superimposed sheets of this gold are cut through with a shears, the newly-cut edges unite much in the same manner as cohesive gold.

The writer has seen a cavity filled with non-cohesive gold by pricking it in with two cambric needles set in wooden handles. The filling when completed was dense, and the layers of foil were so well united that they could not be separated. While nominally a non-cohesive filling, the layers were really held together by pure cohesion at the point where they were pricked, for the needle, in penetrating two or more layers at a time, exposed the central cohesive portion of the layers at the point of puncture, and brought them into direct contact, resulting in union. Further evidence that non-cohesive foil has had its peculiar property imparted to it by contamination with other metallic substances is furnished by melting in the flame of an alcohol lamp a rope of cohesive and one of non-cohesive foil. The globule resulting from the cohesive foil will be bright and clean, while that from the non-cohesive will be tarnished or oxidized, clearly showing the presence of extraneous matter. Non-cohesive gold has for many years been sold and used under the less distinctive name of soft gold. The latter term, however, is a misnomer, for, as we have stated, all pure gold is soft, unless this property has been interfered with by hammering or rolling. No foil can possibly be softer than cohesive foil, but the misuse of the term soft, has arisen from the fact that in the manipulation of non-cohesive foil, the layers will slide over one another without cohering, which seems to emphasize or exaggerate the impression of softness. The absence of this sliding or gliding quality in cohesive foil, naturally but improperly suggests the idea of hardness. In large and accessible cavities, where no necessity exists for the sliding of gold upon gold, cohesive foil will be found to be equally as soft and tractable as the non-cohesive variety. Each kind has its special advantages as well as its definite limitations and usefulness, and harm can only result in the ignorance or violation of the conditions under which each should be used.

The benefit conferred by the discovery of the availability of the cohesive property of gold foil in dental operations, can scarcely be over-estimated, for while the ravages of caries were checked in a very efficient manner by the use of non-cohesive foil, that higher and nobler fulfillment of our art in the perfect restoration of lost tissue could not have been obtained without the advantage of the cohesive property. By the former method, operations could only be performed in simple cavities, and where compound cavities presented, the chisel and file were called into requisition to reduce them to simple ones. In this way, not only were the natural forms of the teeth destroyed, but the amount of masticating surface reduced and much discomfort entailed. With the cohesive property of foil intelligently employed, as it is to-day, all these disadvantages are removed, and the liability to recurrence of decay greatly lessened.

The history of the development of cohesive gold filling has been similar to that of many other valuable methods and processes. At first, its disadvantages alone were seen, and not only seen, but exaggerated. A quality good in itself, was naturally supposed to be good under every and all conditions, and its indiscriminate employment without recognition of its limitations resulted in many failures and brought it into disrepute. The imperfect method of its manufacture and the unintellectual manner of its employment, due to ignorance of its peculiar properties and inexperience in its use, both combined to bring about the unfortunate results with which its earlier use was attended. Each year, however, has witnessed improvement in quality as well as better methods and more suitable instruments for its manipulation, so that at the present time there are fewer failures attending its use, and little excuse for those that do occur. Used with an intelligent recognition of its peculiar properties, and under conditions in harmony with them, it has become one of our most useful servants. In considering its value and availability, it becomes necessary to notice certain practical points both in regard to its properties and manipulation.

The term cohesive, applied as it usually is in a general way, is not sufficiently distinctive to describe the different grades of foil in use to-day. As now manufactured, we have the moderately cohesive, better known as semi-cohesive; the regular or ordinary cohesive; and the extra-cohesive, each differing from the others in important particulars. The former, for instance, would not be sufficiently cohesive to be used upon the surface, while the latter would be too intractable to be used anywhere but on the surface or in very large and exposed cavities. For many years after its introduction cohesive foil was used in its most cohesive condition; in small cavities as well as large, in inaccessible as well as accessible ones, and at the base as well as the surface. Such use was in a large measure misuse, and the many failures that followed led in time to a better understanding of its limitations. Seeing that failure occurred where it only could occur in a cohesive filling along the line of contact between gold and tooth-substance, especially at the cervical margin, it was suggested, and came to be part of the practice with many, to line some part or all of the walls of the cavity with the more adaptable non-cohesive foil, and restrict the use of the cohesive to the body and surface of the filling. The combination of the two kinds of foil in this way, using each in accordance with its peculiar advantages, resulted in a great improvement in the quality of the work produced. With but the two kinds of foil, the strictly cohesive and the strictly non-cohesive, to choose between, such combination of the two was most wise, and continues to be considered excellent practice. One difficulty attending the method was that of manipulation, for it required considerable skill to combine the two without disturbing their relative positions; while another was that in those cases where it might become necessary, cohesive gold could not be readily added by the welding process to the non-cohesive. With the introduction of the non-cohesive variety an advancement was made, for it possesses the ability to be adapted to any surface as thoroughly and accurately as the non-cohesive, and also to have the quality of cohesiveness imparted to it, when needed, by the application of slight heat. In this way the one variety of gold becomes available for use in place of two varieties.

While the manufacturer to-day produces cohesive foil of a far better quality than he did twenty years ago, it is still defective, as a rule, in that the annealing is carried to too great a degree, thus rendering the foil less tractable than it should be. For this reason, the dentist who makes large use of cohesive foil, generally prefers to buy that which is only slightly cohesive, and to render it more so, when desired, by annealing it himself at the time of using. Experience has shown that the quality of cohesiveness can be imparted to foil more delicately and with a wider range of degree by the dentist than the manufacturer, for he can vary it according to his needs. There is a point in the process of annealing, well known to the experienced, which gives to the gold sufficient cohesiveness for all purposes without lessening its adaptability, whereas, if carried beyond this point, its best qualities are impaired. Careful and proper annealing, therefore, is one of the most important considerations in the manipulation of cohesive foil. The extent to which annealing may be advantageously carried, depends on the thickness of the foil and the manner in which it is to be applied. In the heaviest grades of rolled gold intended to be used upon, or near the surface, or, for that matter, where the entire filling is to be made from it in large and very accessible cavities, the gold may be heated to a dull red colour, and the greatest degree of cohesion thus imparted to it without interference with its working properties, for it is intended to be laid layer by layer in a comparatively even and regular manner. With the lighter grades of foil, prepared in the form of twisted ropes or folded ribbons, for use in less exposed cavities and throughout the filling where the same evenness of surface cannot be maintained, so great a degree of annealing would seriously interfere with the proper working of the foil, without conferring any real advantage. It has, therefore, been found best to give to the lighter foil, which is used throughout the body of an ordinary filling, only a slight degree of cohesiveness, reserving the greater degree for surface work where more perfect cohesion is required. The semi-cohesion variety of foil, which does not unite upon casual contact, but will allow one surface to glide over another without interference, and which only becomes united under pressure, is the kind best adapted for the main portion of all ordinary or medium-sized fillings. When nearing the surface, the same gold slightly annealed, will give to the filling that uniformity of texture and density so necessary to usefulness.

As to the manner of annealing foil, various practices prevail ; some passing the foil through or near the naked flame, while others, preferring not to expose the gold thus to the products of combustion, heat it upon a tray of metal or mica held over the flame. The latter would seem to be the better way of avoiding over-heating, but experience shows that equally good results follow the use of the former method, provided proper care be taken. To avoid over-heating by this method with the lighter grade of foils, as well as to attain the proper degree of cohesiveness without harshness, the gold should never come in direct contact with the flame, but be passed quickly just above it. There seems to be no preference between the use of alcohol or illuminating gas for annealing, provided the latter is used in connection with a Bunsen burner, affording perfect combustion.

One interesting fact remains to be mentioned in connection with the subject of annealing. For years it has been generally claimed and believed that the so-called strictly non-cohesive variety of gold could not be rendered cohesive by annealing, but the writer has recently satisfied himself by experiment of the fallacy of the idea. Annealing it in an alcohol flame of moderate size does not materially change its quality of non-cohesiveness, but when heated to redness in the larger flame of a Bunsen burner, its condition becomes so greatly changed, that it can be as readily and perfectly welded as cohesive gold. Treated in this way, however, it differs from the ordinary cohesive gold in the fact that pieces coming into slight contact do not cohere, and that mallet-force in some form is necessary to bring about the desired union.

Another very important feature to be considered is that of the form and character of the points used in the condensation of cohesive foil. If gold is torn or lacerated in the course of introduction, additional labour and time will have to be expended in again bringing the severed portions into absolute union. It is therefore the part of wisdom to avoid such severance. This can only be done by using points with the finest and most delicate serrations upon their surface, and that are free from any sharp angles. In addition to this, the face of the instrument should be of such size as to cover considerable surface, and thus avoid piercing the different layers. As we have already shown, cohesion takes place most readily and perfectly when the surfaces of the different layers are brought into absolute contact on all points. This is best accomplished by keeping the surface of the filling as nearly uniformly even as possible, and broad-faced instruments should be used for this purpose. Instrument-points with just sufficient convexity to avoid flatness, and with distinctly rounded edges, will produce better results than any others in welding gold. Fine serrations, while they are unobjectionable and produce good results in connection with slow malletting, where rapid malletting can be employed, as with the mechanical or electric mallet, even more perfect results are obtained by the use of smooth points, or those with but the faintest trace of roughness upon them. Points of this character, of as large size as can be conveniently employed, used in connection with cohesive gold of any form, will produce a filling so compact and homogeneous that it will never scale or pit, but always preserve the perfect surface given to it at the time of finishing. A filling of this character will have not only the appearance but the essential qualities of a mass of cast gold. The pitting and scaling of cohesive-foil fillings which have at times filled the heart of the ambitious young operator with dismay, and have been the cause of much of the opprobrium that has been cast upon the employment of cohesive gold, are attributable to one or more of three causes: too great cohesiveness of the gold; deep serra tions and finely pointed instruments; and the use of foil so thin and delicate as to be readily torn and comminuted. Foil of greater tenuity than No. 4, as furnished under the names of corrugated, velvet, and the usual form of Wolrab gold, can only be safely manipulated in mass in the form of cylinders, mats, or rolls, and then only in connection with broad and finely serrated instruments, employed with the greatest care to prevent laceration.

The recent revival of the manufacture and use of the form of gold known as crystal, mat, or plastic gold, calls for some notice of this variety before leaving our subject. The use of this form of gold for the filling of teeth dates back some thirty or forty years, and has from time to time found much favour with the profession. Its general use has not been continuous like that of foil, but it has periodically claimed attention and received recognition of its value according as some new process of manufacture or convenience of form has again brought it to the notice of the profession. Gold thus prepared by a chemical decomposition and subsequent deposition, whether by the usual chemical processes or by electrolysis, appears as a brown powder, and consists entirely of a mass of crystals lightly interlocked. When in this condition, unlike crystalline masses of most metals, it is capable of being compressed into a perfectly solid and homogeneous mass without the aid of heat. Its purity, as well as its extreme cohesiveness and softness of texture, were naturally such as to commend it to our use for the filling of teeth. Such being the case, why has it failed to permanently hold its place among the forms of gold in general use? The answer is easily given. The very qualities which made it valuable led to its abuse. The ease with which it could be placed and packed in position, added to its extra cohesiveness, invited carelessness and led to failure. Each generation of dentists has been fascinated by its attractive qualities, used it more or less extensively, met with failures, and abandoned it, only to have the same course repeated by the generation following. It has always possessed the good qualities attributed to it, and the best results have been and can be obtained with it, when its peculiar properties are thoroughly understood, and when experience in its manipulation has led to overcoming the difficulties attending its use. In its loose and cohesive condition, it is not only easily comminuted, but it also so readily coheres with similar masses upon mere contact that spaces are often unconsciously bridged over by it, and the resulting filling, though seemingly compact and homogeneous, is really more or less porous, and hence faulty. On account of its extreme delicacy and tenderness, success in its use requires that it be most carefully handled and compacted with broad-faced instruments, and that mallet-force for its further condensation be not applied until each piece has been well tamped into position by hand pressure. It is further necessary that each portion be carefully and exactly placed, for once in contact, its cohesiveness will prevent even the slightest change. To manipulate it according to these conditions, requires the expenditure of more time, and the exercise of greater care, than any other form of gold, and for these reasons its use has from time to time been abandoned by the busy practitioner.

The Dental Cosmos.

THE CAST FILLING.

By OLIVER MARTIN, L.D.S., Ottawa, Ont.

FOR some reasons the porcelain filling has been called plastic filling. It appears more reasonable to call it porcelain filling, as a plastic filling has reference to soft substances, when placed in the teeth, as the many amalgams in use. The porcelain filling is cast, or moulded, baked before it is placed in the cavity. When you have not the material for the purpose, take a piece of fine earthenware, such as a cup, grind it as fine as flour between two flat irons, make a paste with water. You now wish to test the strength of your porcelain, dry it on your stove, take a clean crucible of small size; this is your furnace. If you place it inside of a sheet-iron cylinder it will retain the heat better. Place the crucible on its side in the cylinder, which is also on its side, place the porcelain in the crucible; being on its side, gives you surface enough for three or four fillings, then use the blow-pipe; in a few moments your filling is brought to a red heat, which is sufficient to unite the particles together. Care should be taken not to bring the filling to a white heat, as it renders it brittle. If the stoneware is of sufficient strength no other ingredient will be necessary, but should it prove otherwise, use one-third of ground glass, mix the two flours well together in the dry state; this will give you a strong porcelain when baked, but not fused. The process of moulding and casting is so well known that it needs no repetition; if your plaster mould is not sufficiently strong to press your paste firmly together, make a mould of zinc, as much depends on the firmness of your paste to make strong porcelain. The adjustment of a porcelain filling should be done before it is cemented in the tooth, by placing it in position and testing the articulation of its contour, as it may project too much beyond the walls of the cavity. Here skilful grinding comes into play, as a want of judgment will spoil the filling. It requires skill and practice to fill a cavity with porcelain, so as to appear like the tooth. The colouring of the flour with chrome yellow and other unfusable earths of different shades, is more difficult of adjustment than the cast gold filling. The gold can be malletted with a fine point plugger after it is secured in the vity so as to spread the surface of the gold over the cement rovided twenty-two gold is used), to the walls of the cavity. his cannot be done with porcelain. Why? Greater nicety of adjustment is required. The use of a screw to retain the filling in position is superior to the pin cemented, as it binds it to the walls of the cavity with a pressure that does not give away. When you mould your porcelain filling, place a pin in position in the mould the size the screw is intended to be; this will be according to the size of the filling, so as not to weaken it. When the paste is dry, draw the pin out gently, with a slight turning motion. This being successful, the filling nicely adjusted in the cavity (we pass over the baking, &c.), take a drill that will pass in the hole of the filling freely, and drill into the tooth for a few threads of the screw. The length of the screw is taken, take a gold wire the size of your drill, drill a hole into a small piece of thick gold plate and solder your wire to it, this will form a nice head to your screw when finished. Be sure the screw does not bind in the hole of the hard filling, else there is danger of forcing the filling in two. When the screw has been cut the length to bind the filling firmly, place a washer of two or three folds of gold foil to cushion the head of the screw on the filling, this is afterwards trimmed. A tooth can be filled with soft gold foil that will fill every pit of the cavity. When the porcelain filling is pressed in and held by the screw, allowing the foil to project beyond the walls for a good finish, very nice work can be done in this way, still gold should have the preference for small size fillings. A large porcelain filling can be managed very well, like a crown, but gold will allow you more manipulation. Placing porcelain crowns on teeth is not new, it is the same as the pivot tooth which has been in use many years, the improvements that have been made are the placing of crowns on any tooth, or roots, partial or entire. Harris speaks of porcelain crowns, twelve years ago; but we have, in the dental profession, many young practitioners who are apt to grasp at every new, and overlook many important and good points of the past, unless they are brought forward occasionally in the journals of the day. Apart from this, a few steps in advance are made as regards the method of manipulation, material used, that proves itself superior to an old method. By simplifying, it brings it anew before the dentists of the day, and is not a mere repetition.

Dr. C. H. Land, of Detroit, claims to be the originator of the system of casting filling crowns, from all kinds of material. He may be what he states, still there are points in what has been stated that may be of benefit, if it was nothing else than the use of plumbago as a mould for fine castings, as it is far superior to sand, as its atoms are flat, while those of sand are round and cannot take as fine an impression, nor will it pack as closely. To use plumbago for the zinc, will be found much superior to sand. It was stated that a little plaster would make the mould stronger, but it is not absolutely necessary, if a flask be used. The finest castings can be made with plumbago, and it is capable of being used over and over again, by crushing and sifting afterwards.

To continue these remarks on this style of work may give some new ideas. If not altogether original there are always a few points in advance, what the dentists are looking for. We cannot speak of a method for saving teeth or to supply their loss without a repetition of an old subject, but to speak of it is to keep it young. There is no doubt that the cast crown is superior to the cap, in gold work, when a root is projecting a few lines above the gums. The cap is made to fit round it like a clasp, and the cement fills the imperfect adaptation of the two hard bodies. This can be accomplished with the cast crown when an impression is taken of the root, and a cast from that impression. The adaptation of these two hard bodies is more perfect than can be produced by swedging, owing to the spring in the gold plate. But a gold crown of solid gold is expensive, and the appearance of gold in the mouth is liked by the majority of people ; they would not like the appearance of tin if it were as good. For this reason the dentist is obliged to conform himself to the pocket and taste of his patient. The cap has become very popular, but there is a difficulty in swedging a cap an inch long by a quarter of an inch in diameter to form a bicuspid, and even a molar is difficult to swedge from one plate of gold. To do this the gold requires to be very fine, like the No 1 gold used as a plate for finishing fillings. A little heavier plate can be used with this gold. An incisor cap can be swedged from one piece of plate ; by annealing frequently, it will stretch without breaking. For durability a cutting edge cap can be cut from the same, dry and soldered ; this makes a very nice piece of work. When the gold is not as fine the size of your tooth model is taken and a ferrule is made a little smaller than the model and soldered. The cap is afterwards soldered on the ferrule the edge of the cap being trimmed to the ferrule, and the solder finished on the ferrule, it is ready for the swedge, being careful to anneal frequently and not to stamp at one great blow, but by gradual taps. In this manner the form of a gold tooth can be produced. The die can be made of cast iron, if the zinc will not stand the cutting edge of the incisor. In a crucible place small pieces of iron; when melted add one-half of iron pyrites, this will run very fine and makes a good die. Place in the sand with a ring, pour zinc round it to give it weight. The concave die can be made of zinc or type metal, and strength can be gained by placing a wire in the impression which is held by the plaster, and will hold the additional plaster that is to be formed as a tooth. The filling of the cap tooth with the white cements is very good, but to pack it with rubber and pressing the soft rubber on the cast of the root, and vulcanising it there, gives a perfect adaptation and a stronger tooth. The advantage of this packing is that holes can be drilled into the hard rubber and pins screwed into it, they can be cemented to the roots. The wire pins should not be too large, but so they will bend with the form of the canal. They will hold the crown firmer by conforming themselves into the shape of the root canal than if the root canals are drilled straight to receive a straight pin, and the root is not weakened. As before stated, a porcelain crown is very natural, but it is delicate; this makes it difficult to control. Many are broken when on the point of finish, and the dentist is discouraged. A method that will overcome this difficulty is to cast your tooth of iron; iron will melt in the crucible as readily as fine gold, and let it be understood that there is no metal more wholesome in the mouth than iron; any decomposition of iron in the mouth strengthens the blood. These remarks are made on account of the oversight that might be made as regards iron in the mouth. We will say your iron tooth is cast, the holes drilled for the pins, it is all fitted, it has been tried in its position in the mouth, the form is satisfactory, it is now ready for the enamel. Melt glass in a clean crucible; when melted add one-half the quantity of glass used of cobalt, this will give you a beautiful enamel that can be tinted with any metallic oxide. When all is ready, the enamel in the fused state in the crucible, dip your iron crown into it, and you will have an iron tooth that will be as natural as any porcelain tooth, with all the strength the dentist can desire, that can be drilled into without danger of breaking, for pins and screws to hold it in position. The thickness of the enamel can be produced by repeated dipping.

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HEALTH AND DISEASE.

Dr. J. B. Davenport, Paris, France.

The life of an individual in its entirety is the result of the total functional activities of every organ in the body.

The life of an individual in relation to all the functions of the body may be compared to an army. The medulla may be likened to the general, who, by a single surrender, may paralyze the entire force ; the cerebrum to the staff officers, or minister of war, whose counsels may be either good or bad ; the heart and lungs might represent the trusted corps, whose failure would bring destruction to all ; the pneumogastric and sympathetic nerves connecting the heart and lungs with the central organs, to the lines of communication between the corps and the central command, and, if broken, favours irregular action that would be disastrous.

The rank and file of private soldiers are the representatives of the many simple functions, such as the special gland and nerve cells, whose extensive destruction brings direct disaster, and *any* destruction is dangerous to all in proportion as such loss yields the balance of advantage to the enemy.

Perfect health can continue only when all the functions of the body are perfectly performed.

Any degree of bodily vigour is consistent with health so long as all the functions are performed in harmonious relation —the powerful athlete and the frail woman may possess equal health, though the forces or quantity of life possessed by each are widely different.

If we could imagine a being endowed at birth with organs and functions so related as to constitute perfect health, and preserving all those fine adjustments till every organ had served out its appointed time ; death to such a one would be but the opposite boundary of the total endowment of vitality bestowed at its conception ; a mere disunion, just as the ripened golden fruit, which always grew in harmony with nature's law, falls loosened by the dew or evening's breath.

Organs are so intimately related that derangements of the function of one affect the working of others, and the fine balance which constitutes the basis of health is disturbed, imperceptibly at first, but unless corrected always tends further from health and nearer recognised disease, just as two parallel lines made to diverge ever so little, at last are widely separated.

Some organs may be performing vicarious functions, and be loaded to so near their own limit that a little extra emergency, which ordinarily they would be competent to withstand, determines their failure. "The last straw broke the camel's back."

We never know the weak point in our organic machinery till it breaks or begins to break. *Nature left alone may fail to successfully combat disease, but meddlesome treatment, that which is opposed to natural laws, will surely hasten failure.*

Nature at times seems prodigal with her supply, but often her provisions are not so abundant as we think. "The sands run out," and nothing turns the hour glass to restore our youth ; wasted energy does not come back.

Man is not provided with new organs for those removed by the surgeon's knife ; his sun of life is lessened by disease, even though he live out his appointed years.

There is more life lived in a year of health than in the same time spent with the functions clouded by disease.

Organs are the vehicles, and nutrition the force of life, digestion the process on which that force depends, and food is the substance on which digestion acts.

Man needs a varied supply, to meet which the digestive organs constitute a series of chemical laboratories stationed along the food stream, for the extraction of every needed principle of force.

Thorough reduction of food is essential, and digestion is active or sluggish, according to whether the reduction was perfect or imperfect.

Insalivation is directly related to mastication. Dalton showed that on the side engaged in the act of mastication, the corresponding parotid gland secreted three times as fast as that of the opposite side, and besides facilitating the reduction of food, it is more and more evident to physiological studies that the thorough mixing of saliva with the food in the mouth is essential, and that the saliva is a true digestive of certain food elements.

Till we can exactly calculate the importance of a normal mixing of saliva with the food on the process of digestion, and know all the remote effects traceable to it, we must assume that this process is essential, and that the best interests of the body require its perfect performance.

We may also suppose, and the supposition is proved to be true by clinical and personal experience, that the well being of the individual requires that mastication be perfectly performed, not simply for the mere reduction of food, but that insalivation may also be completely accomplished, and to that end, both sides of the dental arches ought to be equally competent to perform their functions.

A patient had lost all her right lower molars and all the upper teeth, and mastication was accomplished entirely on the left side, between the molars and a plate worn above. There was an excessive development of the masticatory muscles of that side, and a corresponding atrophy of those on the opposite side, the left masseter was more than twice as thick as the right, and this difference, added to the sunken condition due to the loss of the right molars, caused the deformity of the face to be very marked.

The patient objected to wearing a lower plate, so to partially correct the deformity, a large plumper was added to the right side of the upper plate.

Items of Interest.

CHRISTMAS GIFTS.

By Harry W. Davis, Ottawa, Kansas.

Show me the advisability, or justice, or necessity of granting honorary degrees and I will show you a point to be gained, a favour to ask, or a case of reciprocity. I know some men will bulge out their wrath against the agitation of this subject like a republican against free trade, but that does not prevent the stirring up of the elephant. Look at Italy ; look at Chili, look at England ; didn't they light on this government all spraddled out with their stinger ready to poison the people, but when we ran our stinger out and showed our pugilistic point, they pulled themselves within their epidermis and by their amoeboid movement crawfished, thrusting out now and then, while retreating a pseudopodia, revealing the true inward nature of the amphibians. I think an arbitrating committee composed of practitioners and professors would destroy that pyodemic membrane, and prevent it from performing its function and dictating who shall wear seal skins. The simple alphabetical annex to a man's name does not qualify or increase his knowledge or ability to perform the operations of his profession, neither does it perpetuate his practice or elevate him, except in his own and strangers' estimation. Thus of what intrinsic value is it to him, of what inducement or encouragement is it to a young man to spend from three to four years of his life, and from four to five thousand dollars of money in a college preparing himself for the practice of a profession when he can just as well continue in his overalls, and at some opportune time or circus day, demand a diploma with back pay. What's to become of our colleges and institutions of learning, especially some of the two year six months retail affairs that grind out from 110 to 150 graduates, (real degree fullgrown dentists), and the Lord only knows how many degrees conferred upon men that loom up like a white rag on the front lawn, in the profession that have no degrees, or perhaps of that institution : these incubators recognize every man of influence and silk hat calibre, in fact they feel their inferiority to every man that asks for a degree, and as fast as they are granted this plug hat gets on the roof of that college along with the other battle scarred monumental mementoes of time and weather, and finally the incumbrance is too great and the institution sinks under its air pressure and all that remains of that great land-mark of obtaining knowledge (by the hyperdermic) is the D.D.S. degree delegates. How long will it be before D.D.S.'s will be thicker than democrats in Washington, and colleges deserted and destroyed ? Suppose some big white vest does come from the East and visit our colleges, or read a paper, or give a clinic before our state meeting. Suppose he does know the anatomy of a pet cat or a skye terrier ; or suppose some western pants in his boots, hypertrophied, indurated, organic structure of dental knowledge goes East and does likewise. What's the difference what his abdominal circumference, or cranial capacity is, you have no right to confer a degree upon him from your college, nor he upon you, simply because you have the branding iron in your possession. It is not your prerogative or professional duty to brand every maverick in the field. If a college wants to do something for notoriety and popularity, get out its dehorning machine.

The Western Dental Journal.

A SKETCH OF PROF. MILLER.

By W. C. Barrett, M.D., Buffalo, N.Y.

What has he accomplished? It is difficult to give an adequate idea within the limits of such an article as this. Before he commenced his studies, there was no accepted theory of caries. As many separate opinions were held as there were individual thinkers and experimenters; the most absurd views were advanced, for a majority of the writers had started out with a pre-conceived hypothesis, to which they endeavoured to make the facts conform. Miller went to work the other way. He began his experiments without a theory, deducing that from his observations. It was, in brief, this:—

Dental caries is primarily produced by an acid, which is the product of a ferment organism. Fermentation in the mouth does not essentially differ from that out of it; but one of the by-products of that process is this acid, which Miller demonstrated to be identical with lactic acid. This being produced in immediate contact with tooth tissue, dissolves the calcareous portion, thus forming a pocket in which fermentation proceeds with increased vigour. The inorganic elements of the tooth being first dissolved out, the organic portions are destroyed by yet other organisms, and thus decay proceeds.

It will be seen that some of the causes previously urged are shown to be secondary factors in decay. Thus, the chemists had declared that it was a chemical solution. Miller shows this to be a fact; but the acids are organic acids, produced in the mouth by fermentative organisms.

They had declared that these acids were of sufficient power to dissolve tooth tissue, because they were in an inchoate or nascent condition; and this Miller showed to be true, but in a manner quite different from what the chemists imagined.

Some had declared caries to be an inflammatory process. Miller showed that while this was an error, there was yet some foundation for the assertion.

Every intelligent dentist who has been in practice a few years will remember how, in dental meetings, we formerly debated the question of etiology, and how anxious we were to solve the problem. We felt it a professional disgrace that we did not know the pathology of decay. We wrangled and disputed, and each urged his peculiar views with the greater pertinacity, because he could not incontestably demonstrate them. There is nothing of this now. All clamour is hushed, and there is not a tongue to wag against what Miller has proved to be truth.

Western Dental Journal.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The Inaugural Meeting of the Session was held at the Grand Hotel, Aytoun Street, on Tuesday, the 4th of October. The President (Mr. P. Headridge), presiding.

NOMINATION OF NEW MEMBERS.

The following gentlemen were proposed for membership :—Richard Kloet, L.D.S.I., 10, St. Ann's Square, Manchester; Thomas E. Sherratt, L.D.S.E., Everton Road, Manchester; Thomas Wormald, L.D.S.I., Oldham.

The President delivered an Address on "The Restoration of Defective Teeth" which is published on page 961.

The President's Address being of so interesting and practical a character, it formed the subject of a short discussion, the President stating his willingness to answer any question relating thereto.

Mr. SIMMS asked whether these restorations, especially those of the character performed by the President at the recent meeting of the British Dental Association, were likely to be of a lasting character.

Mr. PLANCK said he would like to ask how long such delicate work would stand in the mouth. Work of that kind was entirely new to him, but he could well believe, that in skilful hands, the most beautiful operations could be formed; the only question being in regard to its durability.

Mr. TAYLOR said that to his mind, the weakest point in this beautiful work would be in the cement necessarily used to join the mineral to the natural tooth; his experience being that any white cement used, would prove too soluble to give lasting results.

Mr. G. G. CAMPION said there were several points in regard to this work, upon which he desired to say a few words. First, in regard to the relation of the colour of the facing to the natural tooth. He had found that in restoring, say the corner of a broken central incisor, that the tooth which was apparently the same shade as the natural one, before being ground down, seemed to alter its colour and become dark when it was fixed with cement. He should like to ask Mr. Headridge if he had observed the same thing. With regard to the durability of such work, which some members had questioned, that was a point upon which it would be interesting to have Mr. Headridge's experience. His own opinion was that these mineral restorations were more durable than one at first sight would be likely to imagine. With regard to the durability of the cement used in fixing the mineral, Mr. Campion thought they were apt to be too suspicious of it, because of the way in which ordinary osteo stoppings wore down, but under the same conditions the same filling material would last a much longer time when used merely as a cement to join the mineral to the natural tooth.

The President in reply stated that these facings were much stronger than they appeared. Referring to the demonstration at the Association meeting, he stated that the tooth was severely tried by a gentleman present, who, however, failed to break it. One reason why it was strong was because he had thickened it at the back with "Rose's" mineral, so as to finish it off in harmony with the other teeth. He had done such an operation since, only instead of putting the pins on each leg, as it were, of the mineral he put a pin on the tip and a pin on each side. He used thin platinum foil to form the back, which added to its strength. The fact was, he did not know why it should break. In regard to the cement, Mr. Campion had really answered that question. He had a patient who some time ago had met with an accident, and broken her two central incisors — the front approximal corners — off. They were both very thin teeth. It was a difficult case, because he had not much width of tooth substance to drill the holes in to carry the pins. He performed the operation successfully, and the teeth were just as sound now as the first day he cemented them. He used Poulson's cement. As Mr. Campion had said, it was possible to fit the pieces of mineral as close that only a trace of cement was exposed. The point was to make the union as perfect as possible, and in this case he had no doubt that the operation would stand very well.

Mr. Planck rose to propose a vote of thanks to the President, and in doing so took occasion to thank him for his admirable paper.

Mr. I. Renshaw seconded the proposition, which was carried with acclamation and appropriately responded to by the President.

Mr. L. Dreschfeld proposed a vote of thanks to the Dental Manufacturing Company for their splendid exhibit of dental appliances.

Mr. Simms, in seconding the resolution, drew attention to the difficulties the English manufacturers laboured under, as compared with their American brethren, inasmuch as a high tariff, in some cases prohibitive, was imposed on the products of English manufacture.

Dental News.

National Dental Hospital and College.—The Entrance Exhibition of £15, which is awarded at the commencement of each Session, has been gained by Mr. Norman Reeve.

APPOINTMENTS.

Mr. Burgoyne Pillin, L.D.S. Eng., has been appointed Consulting Dental Surgeon to the Brixton Orphanage.

Mr. A. R. Colyer, M.R.C.S., L.R.C.P., L.D.S. Eng., has been appointed Dental Surgeon to the Brixton Orphanage.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under:

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A FEW HINTS TO STUDENTS.*

By William Rushton, L.D.S., Eng.

Mr. President and Gentlemen,—It was with great pleasure that I acceded to the request of your Secretary to read a paper to-night, because I thought that an evening might be profitably spent in thinking over, and discussing a few points that crop up in every day practice.

To many here those remarks may seem of a very elementary nature, but I hope they may bear them with patience, remembering that if it is good to "seek fresh woods and pastures new," so it is also sometimes good to "repeat a thrice told tale." We are all students, and I hope we will remain so to our dying day. It is only fashionable young ladies who "finish their education."

Firstly, I cannot too strongly impress upon you the importance of cultivating a systematic method. Acquire the habit of going through a fixed routine upon every mouth which presents itself. The first thing to do is to ask the patient the reason of his requiring your aid, and then by a series of intelligent questions, gain a rough idea of what is the matter.

After this has been done, proceed to examine the mouth in a systematic manner. A good rule is always to begin at he left upper molars, look out for caries on the crown, mesial, distal, and buccal surfaces; if you see an opaque white patch where two teeth meet, break down with a chisel without hesitation, though you may see no caries. Examine the bicuspids in the same way. Look out for caries in the canine on the mesial and distal surfaces near the gum, and erosion on the labial surface. In the incisors in addition examine the pit on the lingual aspect where the two ridges of the cingulum join, and so work round to the right upper wisdom. Also note which teeth are filled, whether any look like dead teeth, any signs of abscess, pyorrhœa alveolaris, looseness or tartar. Then turning your mirror on to the right lower wisdom, come right round to the side you started from.

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* Read at the Students' Society, National Dental Hospital, London.

Now you have done two important things, you have learnt your patient's sensations, and you have made yourself acquainted with the tooth or teeth that may or may not cause those sensations, and it is in diagnosing, differentiating and scientifically relieving that your skill comes in.

Three instruments should always be at hand in examining the mouth; the mirror, the probe, and the dressing forceps with cotton wool, or still better, bibulous paper.

The mirror should be held in the left hand in such a manner that it reflects light on to the tooth under examination, and I may here remark that the mirror which has been scratched by corundum or disc, should be kept only for such times as you are using corundrum, disc, or pumice, and that for filling or examination purposes, you should keep another, and a faultless glass. Another point in the mirror is, that, it should have a stiff handle. Those folding mirrors which I have occasionally seen, are useless and vexatious; it is impossible to press away the cheek or control the tongue with them. I am told they are handy for the pocket, then by all means keep them in the pocket.

The dressing forceps grasping the cotton wool should be held in the right hand, and should accompany the mirror in its travels, clearing away saliva and mucus. Then lay down the dressing forceps, and go round each tooth with your probe, looking out for caries in the manner described. The dressing forceps will find out any caries that has made considerable progress, while the probe will find out the beginning of caries and hidden cavities between teeth. The probe is an instrument which should be used with great circumspection. If you plunge it into an exposed pulp, or into the gum, your patient is apt to lose confidence in your skill, and gentle treatment,and the possession of the patient's confidence is half the battle in dentistry.

Having asked your patient a few leading questions, and having examined his mouth, you can as a rule make a pretty shrewd guess as to what is the cause of his trouble.

Let us take a typical example or two.

A patient comes to us complaining of toothache. Toothache may be caused by any of the following :—

Sensitive dentine	(*a*)	caries.
„	(*b*)	through erosion.
„	(*c*)	metal filling.
„	(*d*)	recession of gum.
„	(*e*)	attrition.
„	(*f*)	mechanical injury.
Irritation of pulp	(*a*)	through exposure.
„	(*b*)	through the action of a filling.
„	(*c*)	intrinsic calcification.
„	(*d*)	mechanical injury.
Inflammation of pulp acute and chronic with or without periostitis.	(*a*)	through exposure.
	(*b*)	through a filling.
	(*c*)	though mechanical injury.

Irritation or inflammation of the gum through the pressure of food or a filling.

Periostitis, through a putrid pulp or mechanical irritant, such as the bristle of a toothbrush, &c.

Alveolar abscess.

Exostosis.

Painful eruption of wisdom teeth, irritation or disease of the central nervous system, and I daresay, some more which I have omitted.

So here we have a variety of causes for the disease on account of which our services are sought, it is our business to find out which of these is the enemy in each particular case, and to combat it.

Now, never do what I have sometimes seen students do, viz :—find out a carious tooth and apply the rubber dam without asking a single question (and by applying the rubber dam, doing away with their patient's ability to answer questions) not knowing even whether the tooth is alive or dead. Before you apply the rubber, or start excavating, try and get to know all about that tooth.

Q. Where have you felt the pain?

A. The patient usually places a finger near the seat of pain, this may be a guide, but is not a criterion, as their feelings often misguide them.

Q. How long has the tooth hurt you?

A. For a fortnight on and off, but it has been getting worse.

Q. Does it keep you awake at night?

A. I did not sleep a wink last night.

Q. Any swelling or gumboil?

A. No, but very painful to touch.

Now, by these questions, we judge that there must be acute inflammation, though whether caused by the pulp only, or the periosteum only, or both, we are not quite sure. True, we could see and feel for ourselves if the tooth is very painful, or if there is any swelling, but if we can gain the same information without giving our patient pain, it is our duty to do so.

We examine the mouth as already mentioned, and find an upper bicuspid, the anterior wall of which has broken away, the cavity filled with food and *debris*, a bright red margin round the neck and the tooth slightly loose.

This is one of the most painful conditions with which we have to do, and we cannot be too gentle and considerate to our patient.

Syringe the cavity out with tepid water, dry it gently with bibulous paper, and proceed with sharp spoon excavators to take away the spongy carious dentine. See that your instruments are sharp, cut always from the direction of the pulp never towards it, and don't fiddle about ; let each stroke be decided. Commence at the periphery and clear away all the dentine, save that which covers the pulp chamber. In that pulp chamber you may expect to find one of two things ; either an inflamed pulp, or a disorganised one. You are not *quite* certain which, as the pain of your excavation may have been due to the periostitis present, not only to nerve pain. Take a pellet of cotton wool, dipped in cold or hot water and place in the cavity. No pain means a dead pulp, a start of pain means a live pulp. Slight pressure with a burnisher, with a start of pain, means a live pulp as the pressure is felt by the pulp through the spongy dentine. However, whether alive or dead, your duty is the same, to expose the pulp chamber. This must be done fearlessly, with sharp instruments and a bold hand; and while exposing, do so thoroughly, for the smaller the exposure, the more painful is the process of devitalizing, and *vice versa*. After two or three sharp strokes, you see a bright red spot from which issues more or less blood, and you know that the patient has been suffering from an acutely inflamed pulp with periostitis. Your duty is of course to apply the rubber dam, if possible, though not if too painful, devitalize, extract the pulp later on, and fill in due course.

Let us take one more case. A patient asks you to remove an upper molar, you examine the mouth and come to the conclusion that the upper molar, though somewhat carious is not the cause of the pain ?

Q. Where do you get the pain.

A. It runs from that tooth right up the side of my face.

Q. Does it pain you at any particular time ?

A. Yes, when I drink hot tea, and when I lie down at night.

Q. Does cold hurt you ?

A. No, sometimes I hold cold water in my mouth and it eases the pain.

Q. You have a lower tooth stopped, do you have any pain from that ?

A. I may have, but the whole side of my face seems so painful that I don't know where it comes from.

Q. How long ago was that tooth stopped ?

A. Three months.

Q. Was it painful ?

A. No, not very.

We tap the upper tooth with the handle of our mirror, no pain, we do the same with the lower, and the patient shrinks a little, but says the pain was nothing to speak of.

We get a large pellet of cotton wool, dip it in cold water, and place it on the filling, which is amalgam, no pain. We then get a large ball-ended burnisher and place it in the flame till it approaches dull red heat. Then dry the tooth and place the hot burnisher on the filling. The patient does not feel it immediately, but in a few seconds says : "you have made it ache," or some such remark. Then you feel you are on the track, and at once proceed to drill out the amalgam. When this has been removed, you may find some pus oozing into the cavity. Perhaps you will think that as pus is present, you have a dead tooth to deal with, and proceed to pass up a bristle or barb. If you do, you will wish you had not, for you will find that the lower end of the pulp only is dead, while the apical portion is alive. Thus we find that chronic irritation, (perhaps present before the filling was inserted or produced by the filling) has been going on getting worse and suppuration has commenced. If the inflammation had been more acute the pain would have been localised by the patient to the correct tooth, and there would have been most probably no wandering neuralgic pain, but very likely more periostitis.

We thus have taken two cases, in the first, we find how our patient may help us in our diagnosis, in the second, we see how they may at first mislead us.

Always work with sharp tools. How can you tell they are sharp? Turn the edge towards the light, if you can see a line of light reflected from the edge, it wants sharpening till that line can no longer be seen. Have a stone by you and get into the habit of looking if your instrument be sharp, and if not, of sharpening it.

If you have the misfortune to wound a pulp which has never previously ached, dust immediately the wound with iodoform, varnish with copal, mastic, or carbolized resin, wait until the varnish is dry, and then flow on thin oxyphosphate. Never use gutta-percha in these cases, as the heat and pressure may be injurious.

If a pulp is sufficiently inflamed to give its owner a wakeful night, or even a prolonged pang of toothache, my rule is to devitalize.

White's nerve fibre, loosely twisted round a broach, is very convenient for devitalizing apices of pulps. It is always ready, easily introduced, easily withdrawn, and is efficacious.

I once put in a very satisfactory gold filling, and was surprised and annoyed to see my patient return in a few days, with acute periostitis. I found it was caused by my carelessly leaving the ligature round the tooth after removing the rubber dam.

On another occasion, a similar incident occurred, and I found that this time the periostitis was caused by my leaving too much gold in the filling which was therefore gagging the mouth, and the tooth receiving consequently tremendous pressure. *Verb. sap. sat.*

Mix (in ordinary cases) your oxyphosphate stiff. Thin fillings soon wash away. Have your tooth perfectly dry and ready. Mix quickly always adding your powder to your liquid. If you find you have added too much powder, or have not enough liquid never add more liquid but start afresh. By adding the liquid to the half set cement you alter the character of the preparation. Oxyphosphate mixed thickly and quickly and introduced at once, has enough adhesive power for all ordinary purposes, it sets in a few seconds and forms a much more durable filling than those introduced in a "creamy" state. Do not touch your cement filling until it is set, then trim off, always working towards the edge of your cavity, never from it.

The golden rule for gold fillings is "take care of the edges (especially the cervical) and the middle will take care of itself."

I once asked a student whether he thought a certain cavity was of a proper shape to hold gold. His reply was "It will hold amalgam." Now if a cavity is of a shape to hold amalgam, it will also be of a shape to hold gold. There seems to be an idea among some students that amalgam (being a plastic filling), adheres to the wall of the cavity after the manner of an oxyphosphate. Of course such is not the case, both amalgam and gold fillings are retained by the shape of the cavity. The details may be modified in each instance, but the fundamental rule is the same. If the same pains were taken over the preparation of cavities, and their filling with amalgam, as there is with gold, we should see less of failures in that respect.

No matter with what substance you are filling a tooth, pack it in bit by bit. I know of no exceptions to this rule, except perhaps pin-holes filled with gutta percha. Gold, whether used cohesively or non-cohesively, must of necessity be packed in piece by piece, and (in reason) the smaller the pieces the better; the less likely they are to rock and the better they are to condense and cohere.

Amalgam should also be packed bit by bit. The best carrier I know is one of this shape having a right angled serrated end. Hold your amalgam between the tips of your thumb and index finger tightly, then press your carrier through the outside portion of the amalgam, and it then bears away a pyramidal mass which clings tightly to it. This can be turned upside down and carried to any part of the mouth ; with mine I can fill a distal cavity in an upper wisdom tooth, with very little more difficulty than a mesial cavity in a first lower molar.

Having taken a small mass of amalgam, place it in your cavity and burnish well with a small instrument into your undercut or floor, and so on, until the cavity is full, using a somewhat larger burnisher as you proceed. Finish off by absorbing excess of mercury with tinfoil or adding excess of dry amalgam and burnishing off.

In using white cements, pack or flow in a small portion and see that it reaches the bottom of the cavity. I have seen several cement fillings, including one or two of my own, which, having been put in *en masse* have prevented air from escaping, and the filling has consequently been literally a "hollow fraud."

Pack permanent gutta-percha in a similar manner to amalgam, bit by bit. Tuck it well into undercuts with a small cold burnisher, finish off with hot burnishers and oil of eucalyptus in preference to chloroform, firstly, because it does not penetrate the filling like chloroform; and therefore, does not tend to "rot" it, and secondly, any surplus is not so pungent and burning to the patient's mouth.

In every operation upon the mouth (except extraction with forceps) use your instrument resting on your finger or thumb from a fixed point, the most useful fulcrum being a neighbouring tooth or the tooth you are working upon. By this means, your hand is steady, you get increased power and you have perfect command over your instrument, which, if it slips, cannot slip far enough to do any damage. Are you chiselling an upper molar? Rest your index finger or thumb (which ever you are working from, the front or the back) upon the tooth, and grasping the chisel firmly with the other fingers, let it work upon the guiding finger or thumb, and while these latter are steady, your instrument is safe. The same rule applies to engine burs, excavators, and scalers, and in extraction with the elevator.

In using copper amalgam, heat well and squeeze out excess of mercury. In using any amalgam in which two or more different metals occur, do not squeeze out excess of mercury, but add more filings. The reason of this is that the mercury dissolves the different metals, of which the amalgam is composed, in different degrees, so that in squeezing out excess of mercury, you also squeeze out too great a proportion of the metals most soluble in mercury. Supposing for instance that copper and silver occur together, it is only natural to suppose that the mercury will be much more eager for the silver than the copper, and this being squeezed out, alters the composition of the amalgam.

I have found that new students in purchasing instruments, generally err in choosing them of a large size. These are useful in some cases, but always remember, that, while you can get a small excavator or bur into a large cavity, you cannot get a large one into a small cavity, and in conservative dentistry small cavities are, or should be, the rule.

Never apply the rubber dam until you have roughly excavated and shaped the cavity, as you run the chance of wounding the rubber with your instrument and so are obliged to re-apply it. By trimming your enamel edges, you obviate the risk of cutting your rubber and your ligature passing them up.

Gentlemen, this has been a rambling paper of odds and ends. I trust it has been of some service to some of you, but if it has no other effect than that of eliciting remarks and discussion, it will not have been jotted down in vain.

INAUGURAL ADDRESS.*

By Ed. J. M. Phillips L.D.S., M.R.C.S., Eng.

Mr. President and Gentlemen,—Before commencing my address I wish most sincerely to thank you all for your kindness in electing me as your Vice-President, and I appreciate it the more from the fact that though having always entertained a real and deep interest in the welfare and progress of the Hospital and Students, circumstances have for some years past prevented me from taking as active a share in their work, and that of the hospital as I could have wished, among other reasons the rules of the Royal Infirmary do not allow me hold a duplicate appointment, so that when I was elected as Honorary Dentist to it I had to give up my appointment as a member of the Staff of the dental hospital, remaining only as a member of the Committee, but now that you have elected me not only a member of the Students' Society, but also as your Vice-President I feel more one of yourselves.—I have found it rather difficult to determine what to make the subject of my address ; others who have gone before me have given you the history of this hospital, and also that of the Student's Society from its formation, with an account of the benefits of such societies. I feel also that it would be out of place to read a paper on any given subject which would invite discussion, or to take up much of your time, as we are all looking forward to a most interesting paper by Mr. Guyler, on a subject which, of all others, opens up a wide field for argument. I shall therefore content myself by giving you a few general hints, which I trust may be of some help to you both as students and practitioners ; such as they are, they are the result of an experience since I was first started on my career as a dental student, rather more than twenty-five years ago, by being introduced into the work-room the year before I passed my preliminary, up to the present time, and at this point let me give you my opinion as to the importance of the mechanical training first; the value of it cannot be over-estimated, it is an education for the fingers which is of the utmost use in after life to the Dental Practitioner, it teaches him steadiness of eye and neatness of fingers, and unless he does his best to thoroughly master all its details he can never hope to do work which will be satisfactory to his patients or creditable to himself, nor can he have any real control over those whom he may employ to do that part of the work which he will be obliged to delegate to workmen, when he gets into active practice ; besides this, those who take the trouble, may, during their apprenticeship in the work-room learn much mechanical work apart from dentistry and full of interest to themselves and possibly pleasure to others, and it should never be lost sight of, that a man who can use his fingers deftly is seldom unable to find something to do, should fate so rule it that he does not succeed in the undertaking he has chosen. If you have taken any notice of the demand for, and progress in, technical education you will understand better what I mean by the necessity of educating your fingers.

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* Read at the Students' Society, Dental Hospital, Liverpool.

Now that a practical examination in mechanics is held by most examining bodies I think more interest is taken in the work by students and a suspicion, which I could not help entertaining years ago, that some considered the work-room rather unnecessary, if not *infra dig.* is, I hope a thing of the past. Of late years mechanical dentistry has developed greatly, so that now in addition to gold, vulcanite, celluloid, and continuous gum work, pivots of many kinds and regulation plates in endleess variety, we have crown and bridge work, to say nothing of interdental splints for the treatment of fractures of the jaw; these among the leading items will give you some idea of the necessity for making the best use of your mechanical apprenticeship, for when once you commence work at the school, or practice, your best chance of learning them will have passed, and unless you are capable you will have hard work to keed your place in these days of fierce competition.

Now let me pass on to the next stage in our lives as students, supposing the mechanical apprenticeship is over, we pass on to the theoretical work at a medical school, by which I mean lectures. To many I know these are a sore trial of patience, and some may say what is the use of them; well, it is shortly this: I take it that few, if any, lecturers, pretend that the whole theory, much less practice, of any subject can be learnt from a course of lectures, but they are arranged and condensed in such a way that an attentive student will get the gist of the whole matter, and the arrangement of the lectures will be a guide to him in his reading, but it should be remembered that as each lecture is heard, it should be followed by a careful reading up of all the matter treated of; few students know what trouble and time is given by their teachers in compiling lectures in such a way as to give them their mental nourishment in as condensed, and yet easily assimilable, a form as possible, and if all would cultivate the habit of note taking, they would find it one of the greatest helps; it is a fact that when a lecturer sees his students are attentive and anxious to learn, it stimulates him to increased efforts on their behalf, and adds or lends a pleasure to work, which under contrary conditions is apt to become irksome and void of genuine interest.

Later on, we come to Hospital practice, clinical lectures, and demonstrations, and with the dental student these are carried on at the Dental chair; all this part of the work will be more interesting as you have theory and practice running side by side, and you cannot pay too much attention to it. Watch how experience, work and thought have taught others to come to a ready and correct diagnosis, and then how suitable treatment follows as a matter of course, and here let me say how very important it is, speaking now of dental practice, which of course the student only gains at hospital, and amongst the poorer classes, to cultivate a good manner, by which I mean a kind consideration for the patient and friends, always courteous and polite, do not on any account ever fall into the error of thinking that because your patient is poor and badly dressed, that he should be treated with less consideration than one who is well dressed and pays you a fee; habits once acquired, are seldom, if ever, lost, and the student who treats the poor in an off-hand, peremptory way, is very apt to develope into the practitioner who earns the reputation of being clever, but rough, and perhaps ungentlemanly, and whom patients consult, not because they like him personally, which should be a great point to aim at, but because he is capable, in fact, he is only tolerated. Never be rough or unsympathetic, and never be induced to ridicule, or in any way draw attention to any faults in speech or grammar of a poor person. I mention this as the poor are often most sensitive, and if their education is imperfect, it is not their fault, as a rule. What we have to aim at is to gain the confidence of our patients, and to reassure them, especially when anything painful has to be done, and this is particularly the case in the treatment of children, they differ greatly from adults, and especially the younger they are, in that they are less troubled by apprehension, so that if one approaches them in a kind way, they will submit to almost anything, but never deceive them or their trust in you will go ; do not conceal a pair of forceps and then ask them to let you look into their mouths, saying you are not going to do anything, and then without them being aware of what you intend, extract a tooth ; if you do you may have accomplished your object, but they will never believe either you or any one else, at any rate for a long time ; in short, always take them into your confidence, and if you wish to extract or fill a tooth say so in a way they can understand, but yet not so as to alarm them. You will find that though perhaps hurt, they will neither blame or dislike you.

Now let me draw towards a conclusion, by recommending a few things which I think you should in your work pay special attention to. Take every opportunity of becoming thoroughly efficient in the use of plaster of Paris for taking casts of the mouth as it is the only really trustworthy material, and a good plaster mould will save much trouble in fitting your work when done. Next, it is impossible to know too much anatomy, physiology, and pathology, for without these attempted extractions will end in many disasters, and filling teeth becomes a mere mechanical performance, *i.e.* filling a hole, and you would run the risk of frequently putting an unsuitable filling over an actually, or nearly exposed pulp, or a disordered one, which in a small way is nearly as bad for the tooth as it would be for a man if he put a truss on over an unreduced hernia.

All who have had much experience know that at times, even with the greatest care, a filling may be put too closely on to a pulp without some suitable intervening substance or other treatment, hence the need of our most careful attention to this point. You must not forget that a tooth is a living organ. Again, by all means take every opportunity of learning to apply the rubber dam in all situations, and without assistance, as its use cannot be over estimated, but at the same time do not neglect to become efficient in the use of the napkin, with such adjuncts as rolls of absorbent lint, and perhaps a small pad of blotting paper over the orifice of the parotid duct ; for in every day practice, it would be both unnecessary as well as absurd, to say nothing of the inconvenience to the patient, to apply the rubber in every case ; moreover, time, and the age or condition of some of your patients would render this out of the question.

Then, again, few can estimate the value of the mouth mirror, and you should all learn to use it skilfully, not merely to reflect light, but learn to work with it by reflection, which is easily done with a little patience, always remembering to heat it rather above the temperature of the mouth, either over a spirit lamp or in hot water; this of course keeps it from clouding. If you do this it may save you many an ache in your back, as well as rendering it unnecessary to put yourselves into all kinds of uncomfortable and awkward positions.

Finally let me say, never make a suggestion or say a word that might prejudice a fellow-practitioner in the eyes of a patient or the public, and do not allow yourselves, in a desire to get on rapidly, to descend to any unprofessional conduct ; of course all must live, but do not let the first object of our profession be only to make money. Now gentlemen, let me thank you for your patient hearing, forgive what may seem like preaching to you, and believe that all I have said has been well meant.

NEURALGIA.*

By Mr. F. R. Guyler.

Mr. President and Gentlemen.—The subject I have chosen to-night is one of vast importance to us as Dental Surgeons. In my opinion,its pursuit seems to have been slightly neglected, inasmuch as very little valuable information has been imparted to us through the aid of a text-book on dental surgery. Please do not understand from my inference that I am able to give you any further knowledge on the subject to that which we have at the present time, no, I would rather leave that to some more experienced gentlemen, having a more intimate and scientific knowledge of the disease. We shall just consider a few facts, which, in conjunction with the discussion which will ensue, will perhaps enable us to gain some practical advantage. Neuralgia seems to be too much confounded with Odontalgia, and a brief explanation of each may result in a clearer distinction. Where pain exists in a tooth, and that tooth may be definitely referred to as being the seat of irritation, that is termed Odontalgia, or common tooth-ache.

Where the pain has left the seat of irritation, and is signified as being in any part of the main branch of the nerve, it is no longer Odontalgia, but Neuralgia. In Neuralgia, the symptoms may be removed from the seat of injury, and another tooth, or any part of the face or head may be the residence of pain. Thus, patients have pointed to perfectly healthy teeth as being the seat of pain, when the cause is associated with another tooth often on the other side of the jaw, or even on the opposite jaw. The pain is intermittent, although the causes of irritation may be constantly present, but in Odontalgia, the pain only remains while the irritation is present. Another important indication by which we may distinguish Neuralgia from Odontalgia, is obtained by the condition of patients after removal of the cause. When the irritation is removed, the pain only subsides very gradually, but in Odontalgia, the pain immediately ceases on removal of the irritation.

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* Read before the Students' Society of the Liverpool Dental Hospital.

It does not necessarily follow that there should be any external inflammation attending Neuralgia ; but in Odontalgia we generally find some signs of inflammation, or tenderness, on pressure.

Having accomplished these distinctions, we shall now proceed to discuss the causes of Neuralgia. These causes are very numerous, in fact, all the diseases which are common to the teeth, may set up Neuralgia ; the chief of which are the following :—

1.—Diseased condition of the tooth-pulp, such as acute and chronic inflammation. Pressure of accumulated matter in the pulp-cavity. Formation of secondary dentine causing an undue pressure on the vessels and nerves supplying the pulp.

2.—Diseased condition of the Alveolar Periosteum, such as alveolar abscess, or exostosis. Irritation of the dental nerves, caused by retarded eruption of wisdom teeth, or undue pressure owing to a limited space. Perhaps one of the most frequent causes of Neuralgia is irritation of the nerves associated with the wisdom teeth in some manner, and a most careful examination is advised around these regions.

Neuralgia is attended with some form of vascular disturbance, just as in inflammation ; so that a probable cause of neuralgia is an increased vascular supply to the vessels supplying the nerves, causing a plastic effusion to exist between the neurilemma and surrounding tissues. Mr. Tomes mentions a peculiar form of neuralgia occurring in an edentulous jaw and its cause can only be explained by the fact that the bottom of the alveolus is converted into dense bone by a deposition of osseous matter, an undue pressure being caused on the nerves supplying the alveolus. It occurs generally in elderly persons, its attacks being periodic and occasionally paroxysms result upon very slight pressure. These may be relieved by strong and repeated doses of quinine or injections of morphia. Trousseau mentions another form of Neuralgia which is more severe in its attacks, and results in more serious consequences. This violent form, viz., Epileptiform, has occasionally for its origin some dental cause, and even after removing that cause, many severe operations are necessary to alleviate the pain, such as nerve-stretching, or division of a nerve. It is frequently associated in some way with the lower wisdom teeth, such as a retarded eruption, and, on account of the close proximity the lower wisdom teeth have to the inferior dental nerve, amply explains why the neuralgia should be all the more severe. There are cases on record where these teeth have been grooved at their roots for transmission of the inferior dental nerve, and Mr. Sewill records a case where the roots were actually perforated.

Epileptiform neuralgia has resulted in such serious conditions of tetanus, trismus, ptosis, epilepsy, etc., but it is not within my province to enter upon these this evening, even though I had time, and I shall therefore be content in mentioning that these several diseases have been traced to Dental causes. We should never be influenced by the patient as to the probable cause of neuralgia being in a specified tooth, as patients are liable to point to perfectly healthy and innocent teeth as being the seat of irritation, and to determine the cause, it is the dentist's duty to make a careful thorough examination of the mouth to explore any morbid conditions associated with the teeth. First, remove anything which is likely to set up irritation, such as tartar round the necks of teeth or loose stumps; then there is a better chance of making a more correct diagnosis of neuralgia.

In making a correct diagnosis, we should carefully examine with mirror and probe. Having found any cavities in the teeth, next test whether the pulp is alive or dead, and if an exposed nerve, we have at once a probable cause. Should there be any dead teeth present, it is not likely they will induce neuralgia of themselves, although they may be the cause of irritation indirectly.

If there should be present any roots, test whether they are alive or dead, by passing up a Donaldson's bristle. If all these fail next ascertain whether there are any filled teeth in the mouth and should this be the case the next step is to test their vitality thermally.

In order to discover whether a tooth is alive or dead proceed as follows :—Apply to the surface of a tooth, a jet of cold water, or a piece of cotton dipped in cold water by means of conveying forceps, and if the tooth responds to any pain or uneasiness, we may conclude the pulp is alive and very sensitive. Should there be no response, next test with heat; apply hot air by means of a syringe, or, to test individual teeth, use a hot burnisher and hold it against the tooth; should there be no immediate reponse, retain it till the tooth becomes quite hot to the finger, and if this amount of heat does not suffice to cause any pain we may at once conclude the pulp to be dead. Having found an inflamed pulp, we may suppose it to be a probable cause of neuralgia and to remedy it the filling should be drilled out and the tooth treated in the usual manner. Another important feature in diagnosing neuralgia is to find out the locality where the pain chiefly resides and if paroxyms be present to notify where they are mostly felt. Having accomplished this we may take the following teeth as occasionally being the seat of irritation, and should nothing special at first sight arouse our interest let our suspicions be specially directed to them.

Where pain is felt in the supra-orbital region we may suspect one of the upper incisors. In the infra-orbital region, the upper canine. In the malar region either the first molar or bicuspids of the upper jaw. Temporal region, either of the two last molars. In the occipital region, or temporo-maxillary articulation, we may suspect any of the lower teeth. I do not claim an absolute correct diagnosis in referring the cause of irritation to exist in the teeth specified, but should we be in any doubt let us direct our attention specially to this system. The pain is often periodic in neuralgia occurring daily about the same hour and ceasing correspondingly. Another form of neuralgia which I have not yet mentioned corresponds in symptoms to the above, viz.,—Idiopathic neuralgia. It arises from constitutional disorders which do not come within the province of the Dental Surgeon, but owing to the great similarity existing between the symptoms, medical men have been deceived as to its probable cause, just as dentists have tried to treat teeth with the object of effecting a cure of idiopathic neuralgia. If we are perfectly convinced that the neuralgia has not a dental origin, we may then advise the patient medical treatment, and having manipulated the several tests which I have previously enumerated it is almost an assured fact that it is idiopathic and not dental neuralgia. I may here mention the condition under which people are more generally liable to an attack of neuralgia. As a natural sequence we would not expect to find healthy vigorous, or robust people martyrs to the disease from slight causes. Those who suffer from any nervous disturbances, or anæmia are more likely to be subject to dental neuralgia.

In a paper given by Dr. Baldwin he mentions that especially in the case of young females suffering from anæmia, neuralgia may arise from such slight causes as exposure of dentine around the necks of teeth due to irritation of the dentinal fibrils and their canalicular terminations. He says the neuralgia is very severe, but can always be easily checked by merely obtunding the sensitive surface. On the subject of the treatment of dental neuralgia, I will not dwell at any length as there is such a great diversity of opinion. Having obtained what we esteem to be a satisfactory diagnosis we must remove the cause. By simply doing this, our work is not entirely finished, for, simultaneously, with this we must relieve the pain. The most effective remedy is certainly morphia, a solution of 1 grain in 20 minims strength, and 5 to 10 minims should be injected. Coincidently with the expiration of its effect may return the pain, and many drugs are brought into use such as quinine, arsenic, chloride of ammonium, etc. My time having expired I must bring my paper to a close, but before so doing should like to take this opportunity of thanking you all for your kind attention.

THE GENERAL MEDICAL COUNCIL.—The next Session of the Council will commence on the 22nd inst., but the Executive Committee meet the day before. It is expected that several cases involving irregularities on the part of practitioners will be considered, and a question connected with the use of the title of Doctor of Dental Science may also be raised. Another subject for consideration will be with reference to the visitation of Examinations in future. It is thought that the vacant Crown appointment for Scotland will be filled by Dr. McVail of Glasgow, who has on former occasions had a seat on the Council as Representative of the Faculty of Physicians and Surgeons.

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RHEUMATOID ARTHRITIS.

Not long ago, the candidates at an Examination for the dental diploma, found a question in one of the papers requiring the enumeration of the various causes producing pathological closure of the Jaws, and when the usual outside consultation and comparison of notes took place, some students were found regretting that they had omitted a reference to that condition known in medical phraseology as Rheumatoid Arthritis. There was a tendency to complain that a knowledge of medicine should be required in surgical examinations, and such an attitude may perhaps be excused at such a moment, but in the cold light of practical experience, it is well that dental surgeons should know of the existence of such a disease and be able to recognize it. If we mistake not, it was some such condition which necessitated the performance of laryngotomy by a watchful anæsthetist who found a gas patient with rigid ribs.

But it is principally in connection with the temporo-maxillary articulation that dentists may occasionally meet with cases, and some knowledge as to the broad facts of this peculiar disease may serve to assist in a diagnosis. From a medical point of view, it is very important that rheumatoid arthritis, sometimes called rheumatic gout, should be distinguished from gout, and Sir Alfred B. Garrod in a post-graduate lecture recently pointed out the serious results of mistaking rheumatoid arthritis for a gouty condition. The treatment which would be usually ordered in cases of the latter, only tends to promote an increase in the severity and extent of the disease, should a mistake be made in the diagnosis, and rheumatic arthritis be unrecognised. Amongst the points to be considered in arriving at a conclusion, a knowledge of the apparent selection of the joints in these affections is often of much use. The great toe naturally points in the direction of gout, but sometimes the onset occurs elsewhere, and requires careful consideration. In rheumatoid arthritis, there is a special tendency to an affection of the jaw and also the back of the neck, the number of cases in which one, or both, of these parts are attacked, being so great that Sir Alfred Garrod thinks at least two thirds of the patients affected by this disease experience these symptoms during its course, and there is scarcely any other disease in which just such a condition of things is found. Occasionally the jaw becomes so rigid as to lead to the removal of teeth, so that nourishment may be administered. In the earlier stages of rheumatoid arthritis, there is a marked alteration in the cartilages ; there is ulceration from the very first, and in time, the bones become completely denuded. In regard to its etiology, although there is no evidence as to a morbid state of the blood, or that it depends upon certain articles of diet, it would seem that some defect in nutrition affects the cartilages, and that the state of the nervous system frequently plays a part. Sir A. Garrod considers that severe and long continued mental depression is a very fruitful cause, but physical causes, such as frequent losses of blood, will also lead to its development. It may occur at any age, but the more common time for its commencement, is from about fifteen to thirty years, and the female sex is the more liable to attack.

We have thought it well to draw attention to some of the points specially insisted upon by the distinguished physician who has so closely studied this disease, in the hope that when the occasion arises, some dental practitioners may, instead of perhaps finding such a condition a stumbling block, be enabled to express an opinion not altogether devoid of weight. It should be remembered that the term "rheumatoid" does not imply that rheumatism is an element in the case, although rheumatic fever may be one of the many causes which lead to the production of rheumatoid arthritis.

Step by Step.—The methods of treating that comparatively new disease, called myxœdema, afford an instance of the way in which the application of remedies is sometimes quickly simplified. Professor Victor Horsley, having shown that myxœdema was due to loss of function of the thyroid gland, suggested that the grafting of the thyroid from a healthy sheep should be tried. It proved a success, and then a case was reported by Dr. Murray, in which great improvement had followed the hypodermic injection of the juice from a sheep's thyroid. Many other cases were so treated with good results. Now, however, it appears that it is quite sufficient to allow the patient to eat the gland, or take a glycerine extract of it. Over indulgence in this dish must be guarded against, for too much is apt to produce symptoms of weakness and faintness ; but, to say the least, it should prove a more acceptable application than by means of the hypodermic syringe. The extract now on sale, "fresh by post every Friday," is prepared under strict antiseptic precautions.

Proposed Dental School in Sheffield.—With a population of 320,000, it would appear that if the necessary number of students come forward, and the other details in connection with carrying on a Dental Hospital can be carried out, there should be no lack of material in the shape of patients. From a paper read the other day by Mr. Harrison, we gather that a suggestion has been made for the establishment of a dental department in connection with one of the general hospitals. It was thought that this, at all events, would be a more economical way of achieving a successful result, than by founding a Dental Hospital as an independent Institution. Some medical gentlemen who listened to the paper, spoke in favour of the proposal, one of them remarking that an enormous number of people came to the Hospitals, and received dental treatment of a rather rough character. We infer from other statements, in the report of the proceedings that these General Hospitals have no Dental Surgeons upon the professional staff.

Medical Aid Associations.—Within recent years, the practice of amalgamating several Friendly Societies in the same town, for the purpose of providing medical attendance upon members, has made rapid strides. Although not offering a very large salary, the Societies have no difficulty in securing the services of a medical man with good qualifications, as there are always plenty of applications for the post. The effect which the establishment of such an Institution has, upon the practices of the ordinary practitioners in a provincial town, is frequently disastrous. Not only do they lose many "club" patients, but in consequence of the officials of the Association inviting the inhabitants generally to join in the benefits provided, and thus insure the success of the undertaking, many well-to-do tradesmen and others of the middle class, desert their old doctor, and subscribe to the Association. A petition is now being signed to the General Medical Council, asking them to consider the conduct of the men who accept such appointments. It is suggested that it is really a form of "covering," that the salary is fixed irrespective of the amount of profits derived from subscriptions, and that the surplus is applied for other purposes. We imagine there is a good deal to be said on the other side, and if the Council accede to the request and state an opinion, it will be interesting reading.

Hospital Federation.—Professor Erichsen has written a most interesting article in which he first points out the unrivalled opportunities, from a clinical point of view, which exist in London. After visiting most of the great medical schools in Europe and America, he is certain that no city in the civilized world offers such an abundant variety of medical and surgical clinical material. And yet our students annually resort in large numbers to the cliniques abroad to obtain that knowledge, access to which is denied them here. Twenty-seven poor-law Infirmaries have over 13,000 beds, and in the General and Special Hospitals there are 8,000 to 9,000 available for clinical purpose. The writer points out that the professional eminence and the special aptitude for teaching of the large body of distinguished men connected with the London schools leave nothing to be desired, but that it is necessary that the material at hand be organised and rendered accessible to the student. The isolation of the different schools should be abandoned, and for the advanced student there must be a system of federation for clinical purposes. Professor Erichsen formulates a scheme by which this might be done, and there are likewise interesting remarks with regard to a Teaching University.

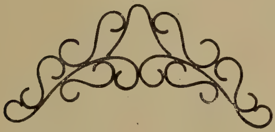
Death from Alveolar Abscess.—Although fortunately of rare occurrence, it is well to bear in mind the possibility of a fatal issue in cases of alveolar abscess. From time to time instances are recorded where pyæmia is caused by absorption of septic material from the socket, and the treatment adopted by Mr. W. A. Lane, in a case reported in the *Lancet*, is worthy of notice. A child of four years had an abscess, in connection with a second temporary molar which was removed, and the cavity was thoroughly cleaned out under an anæsthetic. The abscess had previously opened into the mouth, but there was much diffused swelling over the left half of the lower jaw. The boy became jaundiced and suffered from recurring rigors for four days. It was then decided to make an attempt to stay the progress of the condition by excising any thrombosed veins and clearing out inflamed tissues. The external jugular vein, which contained purulent material, and the facial vein, with their thrombosed branches, and many inflamed lymphatic glands were removed. The patient was better the next day but ultimately died, and at the post-mortem examination a number of abscesses were found in the lungs and liver, produced before the operation.

NERVES IN THE DENTINE.—No doubt many of us are looking forward to the time when some more completely satisfactory explanation will be forthcoming with regard to the sensitiveness of dentine. In the *Deütsche Monatschrift für Zahnheilkunde* there was recently a preliminary communication by Michael Morgenstern, a dentist in Baden-Baden, upon the existence of nerves in the hard tooth-tissues. He says that he had previously shown two professors of histology nerves in dentine, but could not trace them in connection with the pulp nerves. He now claims to be able to show nerves running out of the pulp, and especially from the cornua, into the dentine; they run in little canals, some larger some smaller than the dentinal tubes, from which they cannot be easily distinguished by the ordinary methods of research. Some of the nerves are said to penetrate into the enamel, and minute details are given of the various modes of termination. Although no doubt it is a matter of much difficulty to represent the unbroken continuity of a nerve fibril from the pulp into the dentine we are disappointed at the absence of any illustrations. Information with regard to the methods of preparation and other details is promised later, but we shall await with interest the comments of our own microscopists, one of whom, at least, we believe was some time ago able to show nerves passing from pulp into dentine.

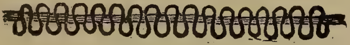
Manipulative Miscellany.

It is requested that all new instruments or articles which it is wished to have described under this heading, be sent *for inspection* to the publisher not later than the 8th and 23rd of each month, they can be returned in a few days. Where, from the size or otherwise, this is impracticable, a clear and minute description will be sufficient; the sole object being to give practitioners a description of everything new, on its own merits and without any intention or wish to put one against another. All makers, vendors, and inventors, are invited, with strict impartiality, to contribute towards this end.

A NEW STRENGTHENER FOR VULCANITE CASES.



This new form of strengthener will be found very handy to use, and easy of adaptation to any case. It is especially useful in that it strengthens, very materially, a weak case, without detracting from the firmness of the vulcanite.



These appliances, it is stated, are made in 16 carat gold, and of various patterns. The metal is placed edgewise in the rubber, and the lower strengtheners have, in addition, a Dental alloy bar, which can also be obtained, if desired, with the upper. Mr. Juterbock is the designer, and the Dental Manufacturing Company, are the agents.

American Colleges.—Though there are twenty-six colleges now represented in the National Association of Dental Examiners, none lack their usual patronage, and some are much crowded. It was thought the extension of time for graduation from two years to three would decrease attendance, but it seems to be a stimulus. *Items of Interest.*

Abstracts of British & Foreign Journals.

ORAL MANIFESTATIONS IN METALLIC POISONINGS.

By Dr. G. S. Junkerman, of Cincinnati, Ohio.

Many metallic poisons which are non-corrosive in character show the limit of their exhibition in the human system by manifestations of some nature in the oral cavity. Some of the corrosive metallic poisons also show this limit in the mouth. This is especially the case with the escharotic corrosive metallic poisons. This paper directs attention to the oral manifestations arising from chronic metallic poisonings. There is a slight suspicion that the prolonged exhibition of arsenic, in proper doses to produce medicinal effects, may result in the death of the pulp of one or more of the teeth. There is no authenticated case of this nature ; but the theory of it, based upon the knowledge of the accumulative nature of arsenic, is a good one. Arsenic in its action has a predilection for glandular tissue ; and if it accumulates in the liver, spleen, kidneys, and lymphatics, why should it not use the lymphatics of the pulps of the teeth ? Arsenic does not always destroy by corrosion, but may produce death of the pulp by over-stimulation.

Manifestations of mercurial poisoning are particularly marked in the oral cavity. Mercury has a selective action for the lymphatic glandular system, and the first indication of its presence is an increased flow from the salivary glands. Mercurial poisoning is very destructive to the peridental membrane. This destruction is usually permanent, and is exhibited by soreness and subsequent looseness of the teeth. The vitality of the general system is lowered by its internal administration, and the general action of the drug is rather to destroy than to build up the human tissues. The death of pulps too often results from mercurial poisoning. This arises from placing fillings made of amalgam in too close proximity to the pulp. The most skilled operator cannot possibly give to a certainty the correct prognosis of a tooth treated with an amalgam filling. If the tooth escapes mercurial poisoning, it is solely due to the degree of vitality possessed by it, or the diminutive size of the filling preventing a sufficient supply of the poison to produce death of the pulp. Many cases of chronic mercurial poisoning require several years to manifest themselves finally in destruction of the pulp. Teeth into which have been stored large quantities of mercury in the form of amalgam rarely retain the vitality of their pulps for any length of time. Unfortunately for future generations, the tooth does not die the day, and often the year, that it is filled. The injury from the much-vaunted external evaporation and subsequent absorption in the oral cavity of the mercury from amalgam fillings pales into insignificance beside the cases of the absorption of mercury by the canaliculi from the inner walls of the fillings. There is no doubt that many obscure cases of a neuralgic nature might be explained from mercurial poisoning of this kind. The evaporation of mercury from fillings after they have become perfectly set is a theory, and founded mostly upon the imagination. The absorption of mercury by the dentinal tubuli is a well-authenticated fact, which can be verified at all times. The specialist therefore, as well as the general practitioner, must shoulder the responsibilities arising from the administration of mercury, local mercurial poisoning destroying the internal vitality and systemic mercurial poisoning destroying the external vitality of the teeth.

The oral manifestation of lead-poisoning is characterized by a blue line at the margin of the gums, usually on the inferior central incisors. In the internal administration of the drug, the slightest appearance of this line marks the beginning of plumbism and where the administration should be stopped. It is claimed by some good authorities that this blue line is due to the deposition of sulphide of lead, and is only found in the mouths of individuals suffering from lead-poisoning and who do not use tooth-brushes. If this is sometimes true, it is not always the case, for the line is found in persons with scrupulously clean mouths, and where all attempts to remove it by mechanical means were futile. The blue line must be explained upon some other hypothesis than a mechanical one. The mucous membrane seems to have a selective action for lead, and the blue line is the inflammatory result of the deposition of this irritant. An argument against the mechanical theory also is that the deposition, if it proves to be such, is found in a place very freely bathed in saliva, while those parts of the teeth comparatively free from saliva show no signs at all. The blue line cannot always be taken as proof positive of lead-poisoning. Mercurial poisoning will always produce the same condition; but a differential diagnosis can be made, if not by the history of the case, by the number of the teeth affected, the lead-poisoning being restricted to the front teeth. What is more difficult is a differential diagnosis between lead-poisoning and pyorrhoea alveolaris in its first stage. The blue line in both conditions is frequently identical in appearance, and we are compelled to depend upon the history of the case. Time clearly determines the diagnosis, however, lead manifesting its characteristic constitutional symptoms, and the arrival of the pyorrhœa alveolaris to the pus stage.

The specialist is frequently the first called upon, on account of the unsightly appearance of these blue lines; and this local symptom may for a long time remain the only sign of the trouble, there being no systemic symptom marked enough to attract attention. This local lead-poisoning may be brought about by the use of tooth-powder. What occasion there is for making lead an ingredient of tooth-powder may not appear clear; but that it has been found there is an authenticated fact. Powdered acetate of lead is usually the compound used, and its virtue to the stupid and unprincipled tooth-powder charlatan lies in its styptic and hæmostatic properties.

Dental Cosmos.

CARE OF THE DECIDUOUS TEETH.

By Dr. H. J. Cole, Norfolk, Neb.

This class of patients require more tact and skill for successful management, and is probably more of a strain on the operator than any other class. But they must be served, and one should endeavour to impress upon the parents the great nesessity of looking after these teeth and not allow them to decay down to the gum margins without an effort being made to preserve them. The natural way is for these organs, by the absorption of the roots, if not actually to fall out of the way of the permanent ones, to become so loose that they are easily displaced. If for any reason such absorption does not take place, under no circumstances should the first one be allowed to remain in place till the second is making its appearance through the gums, causing irregular permanent ones. Neither should the first ones be removed too soon for obvious reasons. Whilst a great deal of the alarming prevalence of decay is owing to lack of function, yet instruction should early be given in the use of the tooth brush, and those in charge of children should be impressed with the importance of frequent and thorough cleaning of the teeth as well as the whole body. After their eruption, they should be examined from two to four times a year, and such attention given as the case may require. When the time comes for their removal the skilful dentist is the proper person to perform such operation.

We come now to the treatment of caries in such teeth, and take it for granted that all are agreed that such should be filled.

For cavities of decay where the pulps are not exposed in preparation for filling use sharp spoon and battle-axe excavators removing the decayed tooth substance as carefully and thoroughly as possible. Seldom if ever use the engine in such cases, as the cavity can be prepared with much less dread, and almost as quickly with the proper excavators. For such cavities on the grinding surfaces usually use amalgam, and in approximal cavities where a sufficient undercut is easily obtained, also use amalgam, but where one cannot get sufficient undercut without causing pain, quick setting cement, and frequently, gutta percha is the best thing to be used. Often in approximal cavities where both teeth are involved good results are obtained by using gutta percha, pressing it into the cavity, uniting both teeth by the filling.

When the pulp is exposed and badly inflamed, causing paroxysms of pain to the little sufferer it is a trying time both for operator and patient. In such cases always the first thing is to relieve the pain, and by washing the cavity with warm water, drying and applying a little oil of cloves the desired result will usually be obtained. The author has also had good results with campho-phenique. In nearly all such cases keep the cavity sealed with occasional changes in the dressing till the pulp dies, then remove and fill the canals with chloro-percha and the cavity of decay either with gutta percha or amalgam. Where there is a putrescent pulp causing an abscess to form, accompanied by profuse swelling of the surrounding tissues, as in the former case, the first thing is to relieve the pain, though the method of relief be quite different. Usually the desired result may be obtained by removing the debris from the cavity opening into the pulp chamber and letting the pus escape. Then by applying a dressing of oil of eucalyptus or campho-phenique, seal up the cavity temporarily and dismiss the patient for a few days. As a rule at the next visit the root and crown can be filled. Then proceed as before described.

If the pus cannot be got rid of in the way indicated it may sometimes be advisable to open through the gum ; but if the child be 7 years old, for either the first or second molar, extraction is better than the latter method. For it is a clinical fact if either temporary molar abscesses and is removed as early as the seventh year, before the eighth the bicuspid is making its appearance.

The Dental Review.

EXTRACTION OF THE PERMANENT TEETH.

By Eugene S. Talbot, M.D., D.D.S.

To my mind, there is no one cause that has produced such a baneful influence upon the jaws of the present generation as that of dentistry. The constant extraction of the permanent teeth, from one generation to another, before the osseous system has been fully developed, is developing a race of individuals with small jaws. In my investigations during the past fifteen years for the cause of irregularities of the teeth, I have become convinced that the jaw-bone proper, and the alveolar process are two separate and distinct structures. The manner of their development and their functions are independent of each other, and therefore, they should be regarded as separate and distinct bones.

The maxillary bones proper are composed of dense compact tissue, and are so constructed as to resist force. They develop from four centres of ossification and eventually blend into one bone, the superior maxillary bone. This bone depends upon the nerve-centres and blood-supply for its development, and is subject to influences such as hereditary taint, constitutional and local lesions, early or late ossification of cranial bones and sutures, for its size and the position it will occupy in relation to other bones of the cranium. After it has developed, it remains throughout life, different thus, as we shall see, from the alveolar process. On the other hand, the alveolar process is made up of soft, spongy tissue ; for its development, shape, and size, it depends entirely upon the teeth and not upon the jaw. When the teeth erupt, the alveolar process builds itself up about them. If the teeth are extracted or do not develop, no alveolar process is present. The alveolar process develops and is absorbed twice in the life of an individual, provided the second set has been removed. If a tooth of the first or second set is extracted, no matter from what part of the arch, and all the other teeth remain, the alveolar process will absorb at that particular point.

If a tooth erupts inside or outside of the arch, the alveolar process will assume the shape of the teeth. If the jaw is arrested in its development and the long diameters of the teeth are greater by from one-fourth to one-third than the circumference of the jaw, then as the teeth erupt and find their way into position by wedging themselves in between each other, the diameters of the teeth being greater than the circumference of the jaw, the alveolar process builds itself up about the teeth and upon the outer surface of the jaw On the other hand, if from constitutional causes the jaw-bone proper should become excessively developed and the long diameters of the teeth should be considerably smaller than the circumference of the jaw, then in the greater number of cases the teeth will remain close together and the alveolar process will develop among the teeth but upon the inner aspect of the jaw. It stands to reason then, that the teeth in their relation to one another are like the staves in a barrel or the stones of an arch ; each depends upon its neighbour to hold the barrel or arch together ; remove one, and the barrel or arch will collapse. Remove a tooth before the twenty-second year, and the arch or alveolar process will fail to be developed. It will be seen by this argument that the size which the alveolar process will attain is not due to a physiological development, but to a purely mechanical development.

About thirty years ago dentists began to notice that irregularities of the teeth were becoming more common, and if they did not erupt in a fairly normal manner there would be quite a protrusion of the anterior teeth. This subject was discussed in dental meetings, and a remedy was naturally sought for. After considerable controversy upon this subject it was thought best to remove the first permanent molars, because as they were the first teeth of the permanent set to erupt, they were also the first to decay. If these were removed early, sufficient room would then exist for the rest of the permanent teeth to come into their proper place. To such an extent had this fad become universal, that in some communities at the present time dentists are in the habit of removing the six-year-old molars, sound as well as decayed. I am told there are communities in this country where it would be impossible to find a single individual with a first permanent molar.

While travelling in England last summer, I was informed by dentists practising both in England and on the continent that it was the proper thing to remove these molars for the purpose of preventing irregularities of the teeth, and the students in English dental colleges are taught this method.

In reply to one of my letters inviting a dentist of Glasgow to assist me in making examination of the mouths of his patients, he said, "I am sorry to tell you that I am unable to procure the measurements you desire. It is rare indeed to find the sixth-year molars in the mouths of persons at the age of twenty-five, living in Glasgow, especially of Scotch people, which I presume you desire."

Even in this enlightened age and in this country, where dentistry has developed *par excellence*, an article appeared in one of our dental journals in which the author says, "It is the purpose to show that experience proves that its (first permanent molar) timely removal redounds to the benefit of the other teeth of the permanent set, and in the large majority of instances to the comfort of those we serve;" and again he says, "The jaws of the present generation do not seem to be large enough for the accomodation of thirty-two teeth. Witness the large number of cases of irregularities of the teeth which we see in people in our time, when the jaws have to be widened or enlarged to accommodate the teeth, or when the teeth have to be extracted in order to make room;" and yet the doctor is in my opinion advocating one of the most prolific causes of the production of small jaws,—that of the removal of the first permanent molar,—and is teaching by his influence and article the advocacy of this pernicious habit. Why not advocate the removal of one eye or one ear, because, by so doing, the patient who is liable to become near-sighted or deaf may be able to concentrate sight or hearing into the other organ?

The Dental Cosmos.

COMPOUND FILLINGS.

One of the greatest economies in operative dentistry, and the best class of fillings for large cavities, are compound fillings of alloy or oxyphosphate as the main filling, with gold as a cap; or oxyphosphate as a filling and alloy as a cap. These are not only more economical than all gold, but better. An all gold filling cannot be put in as perfectly as alloy or oxyphosphate, and yet, when capped with gold, the filling is as presentable as all gold. The advantage of filling a large cavity with oxyphosphate and capping with alloy is, that if the oxyphosphate is used soft and is of good quality, it adheres to the walls of the cavity, and is, therefore, impervious, while the alloy is more enduring as a surface.

All these fillings may be allowed first to harden, and then a portion cut out for capping, or the capping may be incorporated with the filling while soft. If the latter, only a small portion of the capping material is pressed into the filling while soft, and then, as the filling sets, more is added, first next to the walls, and gradually extended to the centre, and then sufficient is added to complete the filling. Or a thin plate of gold can be fitted to the shape of the cavity, and, after two or three short pins are soldered to the under side, it is pressed on to the soft filling. If you are not sure of its articulation with other teeth, first fill the cavity with wax, and try it on: if on the grinding surface, the plate should conform to the contour of the tooth.

Also, after a root has been properly prepared, a gold ferrule of thin gold plate may be made, and this capped with a plate of the same material for a grinding surface. Then fill the skeleton tooth and the root with oxyphosphate and place in position. It makes a durable artificial tooth.

Items of Interest.

HEREDITARY SYPHILIS.

By C. G. Darling, M.D.

Sometimes called congenital or infantile syphilis. According to statistics one-third of all the children born of syphilitic parents are dead when born, and 70 to 83 in every 100 children born of syphilitic parents die some time in infancy or childhood from no other cause than syphilis. The disease may appear as early as the third or fourth week, or it may be delayed until the twelfth week of life. This period is one of great danger to life. If the child lives the manifestations of disease may wholly disappear and from this time forward the child will seem to thrive. The danger of death diminishes as the child grows older. If there be no appearance of disease until the child is six months old we may expect that he will reach manhood.

There are dangers at every turn in the pathway of life for the child who inherits syphilis. The organs of special sense—the eye and ear—are subject to inflammations which may lead to impaired sight and hearing. The course of inherited syphilis differs from the acquired in that it has no primary stage. It never begins with a local lesion and cannot be divided into stages. Many of the lesions are similar to those found in the acquired disease, are generally symmetrical but involve larger surfaces. The nasal symptoms, usually so late in acquired syphilis, are the first to appear in the inherited disease. Early ossification and changes in the bones are among the common lesions. Skin eruptions are also common, coming as a symmetrical erythema.

Evidences of hereditary taint will disappear under proper treatment by the time the child is sixteen years old, though some lesions have been observed long after this period if the youth be inclined to vicious habits. How much immunity inherited syphilis may exert upon the individual is hard to determine, though it is certain it does not give full protection.

Syphilis is always transmitted as syphilis, though some writers think they can see in it scrofula, rickets and phthisis a parentage of syphilis.

With regard to the syphilitic upper central incisor, the notch is more or less crescentic, and is accompanied by a rounding off of the angles. The tooth is almost always dwarfed as regards its length and width. It is not flattened out as a normal incisor, but rounded and more or less pegged-shape. The enamel may be deficient in the middle of the notch. The teeth are often not properly placed, but incline towards each other or in opposite directions. They are seldom large enough to touch both their neighbours. The teeth are not imperfect in all cases of hereditary syphilis; on the contrary, they may be perfect. An ulcerating gumma of palate, which is almost conclusive proof of syphilis, has been seen when the teeth were perfect.

Mackenzie, of Baltimore, after a careful examination of one hundred and forty infants, finds that:—

1st.—Ulceration may take place in the palate, pharynx and naso-pharynx any time from the first week to the fourteenth year.

2.—When eruptions are delayed the lesions of pharynx and palate are more common and persistent, being the first to draw attention to the disease.

3.—Females are attacked more frequently than males.

4.—Ulceration may occur at any point, but is most common in the palate.

5.—When the seat of ulceration is posterior to the hard palate, the naso-pharynx and nose are the points invaded; when upon the palate, it forms a way through the nasal cavity.

6.—The next most common seats of ulceration in order of frequency are the fauces, naso-pharynx, post-pharyngeal wall, nasal fossa and septum, tongue and gums.

7.—Ulceration of palate tends to necrosis of bone.

8.—Tendency to necrosis exists at all times of life, but especially in early youth, when it is most destructive and less amenable to treatment.

All organs may be diseased in inherited syphilis. There may also be disease of the bones, joints, and loss of hair. When the eyebrows are missing at two or three months, syphilis may be suspected. When syphilis is suspected, study well your case before arriving at a diagnosis. When in doubt, recommend treatment for syphilis and carefully watch the effect.

The Dental Register.

THE USE OF GUTTA-PERCHA AS A ROOT-CANAL FILLING.

By F. G. EDDY, D.M.D.

The material that is simple in its manipulation, the method that may be acquired by the majority, should rank first.

Gutta-percha seems paramount in value from its non-elasticity; its wood-like hardness and toughness when cold; its being soft and easily moulded at high temperatures; its insolubility in water, alcohol, dilute acids and alkalies; its ready solubility in bisulphide of carbon, essential oils and chloroform. It is advantageous to use it in both conditions, hard and insolution, in the filling and closing of canals; hard, in the form of small pellets and cones; soft, dissolved in chloroform, which is the method in common use. Then to this solution of gutta-percha—"chloro-percha," add an equal bulk of oil of eucalyptus and oil of cassia,—the essential oils holding the gutta-percha in solution after the chloroform has to some extent evaporated. All know how difficult it is to carry chloro-percha into canals from the rapid evaporation of the chloroform, leaving the gutta-percha sticking to the instrument rather than to the walls of the cavity.

A prominent, an essential factor to success is that the root be in an aseptic condition. Operators differ in obtaining this result as they do in the use of different materials in closing the apical foramen and filling the canals.

The antiseptics of to-day are familiar, and the list is constantly increasing. The foremost writers upon antiseptics now advocate abolishing, as far as possible, all escharotics and coagulants in the treatment of septic conditions of root canals. No antiseptic in use by the dentist answers these questions so well as peroxide of hydrogen and the essential oils. They are non-escharotic; non-toxic,—yet antiseptic and stimulant; the manner of their use is simple and positive.

In case of immediate extirpation of the pulp by means of forcibly inserting a plug of wool—this being preceded by an injection of cocaine, or the patient being under the influence of nitrous oxide gas,—at once wash the cavity with hot water to stop the hæmorrhage; dry out the canal with a cone of bibulous paper, churn out the canal with peroxyde of hydrogen, instead of carbolic acid, as an antiseptic; then re-dry the canals and fill with solution of gutta-percha in essential oils which is easily worked to the apex and adheres to the walls.

Into the canal filled with the solution, carry a small piece of warm gutta-percha, gently and firmly to the apex, following with the hard cone. The surplus solution will be forced out, and the hard cone of gutta-percha will be cemented to the walls of the canal. It will be seen that this suggestion differs from Dr. How's opinion. "The fluid or soft plastic methods are defective, because it is only supposed, but not known that the foramen is, in fact, tightly closed, to say nothing of the mischief likely to follow the probable forcing of the solution through the foramen."

If the pulp be in a suppurative and disintegrating condition we remove the debris, using the peroxyde of hydrogen from time to time to clean the cavity as we proceed, and dress the root with fibre of cotton or silk, saturated with oil of cassia or other essential oils. When the root is in a healthy condition fill with gutta-percha in the manner before described.

If the root has a fistulous opening, the canal is cleared of debris, and filled with peroxide of hydrogen. By a piece of soft unvulcanised rubber and a blunt instrument used as a piston the peroxide is forced through the canal and out of the fistulous opening, the whole tract being left in an aseptic condition. After again drying the canal, the solution of gutta-percha is forced in a similar manner through the fistulous opening, closing the canal as before, with gutta percha.

During twelve months the author treated the canals of 152 teeth in this way, and only two were removed as complete failures.

The Dental Register.

A BRIEF STUDY OF THE TEETH OF THE PROBOSCIDIANS.

By W. Barrett, M.D., D.D.S.

The paper referred to the manifest entire loss of any preserved specimens of extinct species through the lack of chances of preservation by sudden upheavals or other incidents in the formation of the earth in the earlier periods which would encapsule and so preserve them for our edification. But in the pachyderms as they now exist or have existed in comparatively modern times, modifications can be traced which are a sure indication of the gradual development of certain species through the lapse of cycles of time. Families, whose dental development seem to be widely separated, on close inspection are found to be close congeners. For instance, there is a distinct relation between the dentition of the tapir, with its forty-two teeth, and the elephant with only six. The paper described the manner of the formation of the molar teeth of the elephant, the deposition of the various tissues, and models were shown to illustrate this development, the distribution of tissues being such as to, by wear, prepare the best possible masticating surface. The manner in which these teeth are worn out, cast off and replaced by their successors throughout the entire life of the animal, was described and illustrated. These teeth are erupted in such a way as to best economize the tooth material and furnish the animal with a satisfactory dental organ for a long period. The time of eruption, the number of plates forming the crown, and the duration of each successive tooth, was shown to be regular and systematic, the first molar having a fewest number of plates and the least number of years, there being a gradual increase in each succeeding tooth of both plates and years of life. There are abnormalities in the development of the incisors or tusks, due, probably, to accident to the alveolar process. The celebrated elephant "Jumbo" had had two molars in each jaw fully erupted, and none of the visible teeth occupied their normal positions. The probable reason why the two molars were present at the same time was due to the fact that the animal had always been in captivity and been fed on food free from gritty or wearing material, and the first tooth was not used up in time to be cast off before the full time for the emergence of its successor. This is the opinion of Prof. Flower of the British Museum. But Dr. Barrett thinks it due to some accident to the formative germs of the teeth.

Ohio Journal.

GLYCERINE JELLY FOR MOUNTING.

The difficulty of satisfactorily enclosing micro-mounts prepared with pure glycerine, has induced many workers to substitute glycerine jelly wherever practicable. Many formulæ have been published for this medium, but one recently published by J. E. Huber, possesses a degree of novelty in that he excludes the use of water as one of the ingredients. He recommends that clear gelatine (1 drachm) be allowed to macerate in glycerin (1½ oz. by weight) over night, and that the mixture should then be heated in a water-bath until solution is perfect. Specimens to be mounted, should be soaked first in dilute, then in stronger glycerin, afterwards placed on a slide with as little dilute glycerin as possible, and covered with hot jelly. After cooling, the cover glass is placed over the object, heat applied to the slide, and the cover pressed down into position when the jelly melts. On cooling over night, the slide may be cleaned and finished off. The mounts are stated to be free from the liability to shrinkage that often occurs when glycerine jelly is used.

The Pharmaceutical Journal.

Reports of Societies.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual Monthly Meeting of this Society was held on Friday, October 14th, 1892, at 8 o'clock, W. Robinson Humby Esq., in the chair.

The minutes of the previous meeting having been read by Mr. Burbury Rowe (in the unavoidable absence of the Hon. Sec. Mr. Cecil Bascombe), and confirmed.

The President gave the usual welcome to visitors present.

Mr. Tice was unanimously elected a member of the Society.

Messrs. Reeve, Jenkin, Fogg, Devonshire, Humby and Peacock, were proposed for election.

CASUAL COMMUNICATIONS.

Mr. Spokes shewed two sections, from a monkey, under the microscope.

1.—Temporary and permanent lower incisors, *in situ.* in the jaw, showing the relation of each to the process of absorption.

2.—1st Permanent Molar *in situ.* in the Jaw, and showing transverse striations in dentine.

THE PRESIDENT, Mr. HUMBY, brought forward four teeth.

1st.—A wisdom tooth with supplementary tooth, embraced between the roots.

2nd.—A case of absorption of the 3 roots of upper 1st. molar.

3rd.—A case of deposit of what was apparently tartar at the end of a lateral root.

4th.—A case of geminated lower incisors.

Mr. FARMER related a case of profuse hæmorrhage of the gums that had come under his treatment.

The patient, (30 years of age), complained of profuse bleeding, which had commenced at 5 o'clock in the morning and had not ceased at 2 p.m. in the afternoon, he (Mr. Farmer), tried to check the bleeding with hot water, but with little success, tannin was also used in like manner; accordingly a compress was made and bound on the lingual and labial surfaces of the gum of the left lower lateral incisor, from which the blood was flowing, after this had been in position for eight hours, it was removed, and the bleeding had ceased; he (Mr. Farmer) stated that the patient was a very healthy subject, had had no teeth extracted, but the gums about the lower incisors were very much inflamed. Round the lower lateral incisors was a quantity of nodular tartar. He hoped the gentlemen present would give him a suggestion as to whether the treatment he had adopted was the best one, and if not, what his treatment should be, did a similar case come under his notice.

The President, Mr. Humby, entirely endorsed the treatment of Mr. Farmer 'in bleeding cases.'

Mr. CLARENCE READ said he had never seen a case such as Mr. Farmer had just described; he should have been inclined to apply chloride of zinc to the bleeding gum, and have waited the result—he had found this treatment very useful in arresting hæmorrhage from inflamed gums, which had not readily yielded to other means, Mr. Glassington and other members also spoke.

No more casual communications being brought forward, the President called on Mr. Rushton to read his paper on "A Few Hints to Students," which is published on p. 1009.

The President, Mr. Humby, said he should suggest the use of gas to expose the pulp ; he also questioned the need of overhanging edges or under cuts, as he believed he could prove that by the use of the oxyphosphates in conjunction (in a soft state) with the filling, the latter could be immovably fixed to the tooth, and a great deal of unnecessary pain spared to the patient. He also drew attention to the coarse probes that were in use, and recommended the use of as fine ones as were procurable.

Mr. Glassington said he did not think the use of probes necessary ; he spoke in favour of free chiselling of the enamel, and also referred to the way in which some men used the hand mallet, as if they were hammering nails. In his opinion, the perchloride of iron should always be used in cases of hæmorrhage, and he quoted a case which occurred at the Hospital some years ago, where the blood poured from the socket, and which was successfully treated with the perchloride.

Mr. Clarence Read said the use of a probe having cropped up, he hoped Mr. Glassington would forgive him for what he was going to say ; he thought that a probe was a most useful and essential instrument, especially to students and young practitioners. One might get on without it for some time without seriously coming to grief, but one day, one of your patients whom you would not like to offend, would come up to town, and you on looking round the mouth would tell her, her teeth were sound ; she then, on going into the country, and perhaps a week later, having violent toothache, would loose faith in you, and it would be lucky if she came to you again. He thought Mr. Rushton said he used an oil stone for sharpening his excavators, &c. He, the speaker, usually used an ordinary corundum disk, such as one used for polishing a gold filling, he found it gave the instrument a finely serrated edge, which cut away the decay more readily than the edge obtained by using an oil stone, and it was quite as quick.

Dr. Maughan said he was glad he had heard Mr. Rushton's paper, as that gentleman was always interesting and instructive. In relation to the localisation of the lesion by the pain felt, it was a good question to ask, in which tooth did the pain begin? This question would usually lead to the original cause of the suffering.

A vote of thanks to Mr. Rushton and the President, concluded the meeting.

STUDENTS' SOCIETY, DENTAL HOSPITAL, LIVERPOOL.

THE opening meeting in connection with the above Society was held on Friday, October 21st, 1892. E. J. Phillips, Esq., in the chair, in the absence of Mr. Bates, the President. There was a capital attendance.

The Secretary read the minutes of the previous meeting, and these having been duly sanctioned, the chairman invited any casual communications to be brought forward.

Mr. Gilmour exhibited a case of an extracted upper molar with the floor of the antrum adhering to it. Having explained his views upon it, he brought forward a lower bicuspid, the root of which had a pin of some considerable size lodged in it. Several gentlemen were then proposed as members, after which Mr. Phillips delivered his Inaugural Address which appears on p. 1019.

At the conclusion of his address he called upon Mr. Guyler to read a paper on Neuralgia, which appearson p. 1019. A lively discussion followed, and so heartily was this indulged in, that the meeting voted an extra quarter of an hour for this purpose. Amongst those who took active parts were Messrs. Phillips, Royston, Edwards, Pidgeon, Gilmore, Roberts, Parsons, Black, Mansell, Scholefield. A vote of thanks to Mr. Phillips for his admirable address, was proposed by Mr. Parsons, supported by Mr. Edwards, and seconded by Mr. Gilmore, and after a vote of thanks had been awarded Mr. Guyler, a very interesting and instructive meeting terminated.

Dental News.

THE LONDON DENTAL HOSPITAL, AND SCHOOL OF DENTAL SURGERY.

The Annual Dinner will be held on December 3rd., at the Café Royal at 6.30 p.m. Sir Richard Quain, Bart, will be in the chair.

THE DENTAL BOARD OF VICTORIA.

The ordinary meeting of the Dental Board was held on Friday evening, the 26th, August, 1892, at 8 p.m. Mr. John Iliffe in the chair. The minutes of the two previous meetings were read and confirmed.

Amongst other business the registrar reported that he had written to the dean of the Dental Hospital of London, inquiring whether a gentleman who had been in practice for over nine years as a dentist, and who was also a member of the Dental Board of Victoria, could be admitted to the winter course of lectures in dental mechanics at the Dental Hospital of London by simply paying the necessary fees, without having first of all to enter as a dental student. A reply has been received from the dean of the hospital, Mr. Morton Smale, stating that the letter was laid before the Medical Committee of the Dental Hospital, London, at its last meeting, when the gentleman therein referred to was unanimously invited to attend the course of lectures in dental mechanics in the ensuing winter free of any fee at all. On the motion of Dr. Gresswell, seconded by Dr. Carter, the registrar was instructed to convey to Mr. Morton Smale the feeling of gratification of the members of the Dental Board of Victoria at the courteous invitation conveyed in his letter. Mr. Reeve thanked the Board for granting him leave of absence, and for the honour it had conferred on him in granting him letters credential; he trusted during his stay in the old country to be able to obtain a mass of information that would be of value to the Board in the future.

DENTAL ASSOCIATION OF VICTORIA.

The monthly meeting of the Council of the Dental Association of Victoria was held on Thursday evening, the 18th of August, 1892, at 8 o'clock, at the Melbourne Athenæum. The office-bearers for the year were appointed as follows: President, Dr. Springthorpe; vice-president, Mr. John Iliffe; hon. treasurer, Mr. Alfred Reeve; and hon. secretary, Mr. A. R. Clarke. Attention was drawn to the fact that there was a movement both in New South Wales and in Queensland to provide for the registration of dentists qualified to practise in those colonies, and copies of the bills drafted for the purpose were laid on the Council table. It was resolved to establish a lending dental library in connection with the Association. Information was received from the secretary of Guy's Hospital, London, with regard to the dental school attached to the hospital; it appeared therefrom that fees were not accepted for single courses of lectures in the dental schools, but a student who paid the ordinary fee of thirty guineas could attend any or all of the special courses for dental student. Other correspondence was read, and the Council adjourned.

To Correspondents.

1. Communications intended for insertion in the ensuing number must be forwarded to the Editor, at the Offices 289 & 291, Regent Street, London, W., by the 8th and 23rd of the month, and must be duly authenticated by the name and address of the writer.
2. No notice taken of Anonymous Communications: name and address must always be given, although not necessarily for publication.
3. We cannot undertake to return communications unless the necessary postage stamps are forwarded.
4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only, and we also beg to call particular attention to the importance of a carefully-penned signature and address.
5. All communications relative to subscriptions and advertisements are to be addressed to the Publishers, Messrs. J. P. Segg & Co., 289 & 291, Regent Street, London, W.
6. The Journal will be supplied direct from the office on PREPAYMENT of subscriptions as under:

Twelve Months (post free) - - 14s. od.

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TREATMENT OF DENTAL IRREGULARITIES.*

By Peter Headridge, L.D.S.I.

Great as are the variations which Nature exhibits in individuals of the same species, whether of plant or animal; and wide as may be their deviation from the original type yet there are limits beyond which variation ceases and deformity begins. Although this excess of variation may be so slight as to cause, even in man, little or no inconvenience, yet on the other hand it may be so great as to interfere with comfort, or even to give rise to very severe physical suffering. It is here that science steps in, and by a skilful application of mechanical laws to the requirements of each particular case, combined with an accurate regard to the anatomy of the deformed parts, and the physiological laws affecting them, is often able to achieve results such as the best practitioners of past days would have deemed impossible.

No surgeon or dentist in extensive practice can fail to be struck with the number and variety of the deformities of the bones of the head and face which come daily under his notice. There is one particular species of malformation which of late years has undoubtedly increased in frequency and severity viz., that which consists in a lateral contraction and compression of the bones of the face, especially of the superior maxillary bones, and the various processes and smaller bones immediately connected with them. This deformity, the importance of which can scarcely be over-estimated, constitutes what is popularly known as the "V-shaped" or "rabbit" jaw. It consists of a narrowing of the palatine arch, with an approximation of the alveolar processes and teeth of opposite sides to a greater or less extent. The cavity of the mouth is consequently narrowed and contracted : but this is not all—the palatine processes of the superior maxillary bones, and the horizontal plates of the palate bones form, not only the roof of the mouth, but also the floor of the nasal cavity. This, therefore, shares the contraction, the turbinated bones of the opposite sides being closely approximated to the septum. Indeed, the narrowing of the nasal cavity sometimes constitutes the primary deformity, the contraction of the jaw being secondary in importance, and causing comparatively little inconvenience.

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* A Paper read before the Manchester Odontological Society.

The teeth of the upper jaw are of course thrown out of correspondence with those of the lower one, more especially as the lower maxilla is seldom involved in the deformity to anything like an equal extent. Thus the upper molars and bicuspids will close more or less upon the inner edge of their opponents, or in extreme cases may altogether lock inside them.

The incisors and the canines of the upper jaw may by an antero-posterior, as well as a lateral contraction of their alveoli, be brought into direct apposition with, or even bite within those of the lower jaw, instead of occupying a position slightly anterior to them, as they ought to do; or the upper central incisors may, on account of the V-shape of the upper jaw, project beyond the lower central incisors, crossing their line at an acute angle ; or, as is very frequently the case, the whole of the upper front teeth may slant obliquely forwards and overlap the lower teeth, or even the lower lip.

Such is a brief description of the conditions involved in this deformity. Its effects are almost self-evident, and may be thus enumerated.

1.—The appearance and expression of the face are of course much deteriorated. The malposition of the teeth themselves is constantly brought into view in speaking or laughing, which the narrowing of the jaw often renders an otherwise handsome face unmeaning and expressionless.

2.—Mastication is interfered with by the want of opposition of the upper and lower teeth. The prehension and cutting of food are rendered difficult where the upper incisors either overlap or close posteriorly to the lower ones. The lateral grinding action of the molars is rendered more or less imperfect according as their want of correspondence is greater or less. In those extreme cases where the upper molars lock inside the lower ones their lateral action is altogether impossible. The effects of imperfect mastication are necessarily of the greatest importance to the system generally and cannot be over-estimated. Dyspepsia in every form will be induced either by the swallowing of imperfectly divided food on the one hand, or by the exclusive use of soft and artificially divided food on the other, as by the latter means the proper admixture of saliva, so necessary to complete digestion, fails to be accomplished.

3.—The speech and voice are affected.

A lisping or thick utterance is produced by want of play for the tongue especially in its adaptation to the teeth in the formation of sibilants.

4.—Deglutition, especially of the saliva is, in these cases rendered difficult, hence there is frequently a tendency to a flow of saliva from the corners of the mouth, which is as unpleasant to the patient as it is unsightly to others.

5.—The narrowing of the nasal cavities, by causing difficulty in breathing through the nose, produces noisy and sometimes laboured respirations, and inability to close the mouth while breathing.

6. –It will at once be perceived that crowding and irregularity of the teeth must necessarily arise from this deformity. The proper cleansing of the teeth is interfered with, salivary concretions accumulate, caries of the teeth sets in, and in its turn leads to abscess and the various neuralgic affections of the face and head.

I will now turn to the causes of this deformity, which are of the greatest importance as bearing upon the question both of preventive and curative treatment. They may be classed under the following heads, namely, Hereditary, Intra-uterine, Infantile, and Artificial.

I. Hereditary Causes.—Darwin has adduced abundant proofs of a fact which no intelligent observer can fail to endorse namely, that inheritance has the greatest possible influence in the transmission of physical as well as mental peculiarities. To take an example of every day occurrence. If one parent be strumous, struma will probably show itself in some of the offspring. The children, either of one or both sexes may be affected, or one generation may escape and the disease will manifest itself in the next. But if both parents be similarly contaminated, the constitutional taint will be intensified in the offspring. The same laws which apply to constitutional diseases apply also to physical peculiarities, whether of stature, feature, or malformation. One case out of many may be mentioned in illustration of this. I was acquainted with a family in which two brothers were born with the third and fourth fingers of each hand completely joined together, along their whole length, by a thick fold of integument. Both brothers married, and all the male children of each were born with fingers webbed in precisely the same manner, while the hands of the female children were natural.

Should the same deformity appear in the males of the next generation and so, *ad infinitum*, it is easy to conceive how wide-spread this physical peculiarity might become in the course of a few generations.

There is another point also of much importance in relation to the effect of inheritance upon the particular deformity we are considering. Marriage between blood relations seems to have a tendency to originate certain forms of disease, amongst which idiocy stands prominent; and idiocy is found to be very frequently associated with contraction of the facial and cranial bones. Hence, bearing all the foregoing facts in mind, it will be easy to understand on the one hand how it is that these deformities go on increasing so rapidly in frequency and severity, and on the other hand why they are so often met with in members of the aristocracy, amongst whom marriages between blood relations are frequent.

2.—The intra-uterine causes of this deformity resolve themselves into those producing arrest of development. The superior maxillary bone is very early and rapidly developed, so much so, that its centres of ossification have never yet been accurately determined; hence any circumstances interfering with the general nutrition during pregnancy especially in its earliest stages, are particularly likely to produce arrest of development in this bone.

3.—The infantile causes of this deformity, namely, those which tend to produce it between the period of birth, and that of complete temporary dentition are various.

Here, again, mal-nutrition, either from constitutional taint, or from lack of sufficient or suitable nourishment, plays an important part in producing arrest of development. Just as the whole osseous system may be stunted and dwarfed in its growth by these causes, so one or other of its component parts may be arrested in its development. Difficulty in suckling arising from retracted nipple, or an insufficient supply of milk, may be another cause, also, later sucking of the thumb or tongue as a constant habit, may have the same effect. The first dentition has, as will be at once seen, a most important bearing upon the final shape and size of the jaws. Small, imperfect, or deficient temporary teeth will necessarily tend to produce a contracted alveolus, while their crowded or irregular arrangement may be both a cause and effect. The premature shedding of first teeth again will have a direct tendency to produce this deformity.

4. The last class of causes I have called artificial, because they arise from a mistaken plan of treatment, for which Nature is in no way responsible. I allude to the indiscriminate removal of temporary and permanent teeth "to make room." This is constantly done, and the ill effects of the practice cannot be exaggerated. There is no doubt that the slighter forms of contraction may be originated, or, where such already exist, that they may be intensified into severe forms by this mischievous practice. Still more severe forms will be increased in severity. The temporary teeth are perhaps crowded or irregular, and some of them are removed "to make room" for the permanent teeth which will be larger and more numerous. Or the permanent teeth may come irregularly, and incisors, canines, or bicuspids, are ruthlessly sacrificed to the same mistaken idea.

Every one knows that when a tooth, even a large molar, is removed, the adjoining teeth approach each other gradually to fill up the space by a process of absorption of the intervening bone, thus shortening the alveolar arch to an appreciable extent; hence the greater obliquity of the rami in old people who have lost their teeth, yet when this contraction already exists, it is sought to remedy it by the means which tends directly to produce it.

The treatment of these deformities may be divided into Preventive and Curative.

I.—Preventive measures may be employed during the pregnancy of the mother and the infancy of the child, during the first dentition ; and during the second dentition.

The preventive treatment directed to improving the physical condition of the mother during pregnancy, and of the child during infancy, will be by means of suitable and abundant nourishment. It is a question worth consideration, whether under ordinary circumstances, and especially in large cities the food usually taken contains a sufficiency of the materials necessary for the formation of healthy bone, especially the earthy salts.

We all know that when a fowl is not well supplied with lime in some form, the eggs are imperfectly covered with hard shell.

Some physiologists have attempted to explain the great degeneracy in the teeth of the present generation on the same principle.

It has been suggested that by the exclusive use of white bread from which all the pollard, so rich in earthy salts, has been separated, we deprive ourselves of much that is necessary for the formation of bone ; and that the almost universal adulteration of bread and flour with alum, which, by decomposing any remaining lime salts, renders them unfit for assimilation, still further robs these articles of food of their bone-producing properties. In addition to this, the artificial softening of water before it is supplied to the public, deprives that also of a large quantity of its carbonate of lime.

Physiologists who hold these views point to the fact that amongst the inhabitants of districts, such as Scotland, where oatmeal is largely consumed as an article of diet, or where brown and unadulterated bread is used, the teeth as well as the whole osseous system are better developed and less liable to disease than in districts where contrary conditions prevail. However this may be, it is evident where there is any tendency to contraction of the jaw, or indeed, to any osseous deficiency it will be very necessary to pay great attention to the general health and nutrition of the patient. Another most important preventive measure will be in a scrupulous attention to the first dentition and the preservation of the deciduous teeth. Every means should be adopted for the prevention of their too early loss. Signs of premature decay should be as carefully noted as in the permanent teeth, and remedied by careful stopping. Extraction should never be resorted to, unless absolutely required.

The permanent teeth should be even more carefully preserved than the temporary teeth, and no amount of deviation on the part of individual teeth should tempt the dentist to remove them on the plea of making room. On the contrary, where any tendency to contraction exists, such teeth should be preserved, and afterwards by suitable mechanical means be restored to normal position.

2.—When, however, notwithstanding all precautionary measures, contraction of the alveoli is found to exist to a greater or less extent, or where, as is often the case, such precautionary measures have either been altogether neglected, or the means adopted have been such as to increase, instead of to diminish, the mischief, then the question of curative treatment will have to be considered, and it is here that I claim originality both in the means employed, and in the method of application.

It has long been endeavoured to rectify the malposition of individual teeth by the continuous application of moderate force by means of springs, but the plate used has been so imperfect that the results obtained have not been commensurate with the inconvenience inflicted upon the patients. Also, attempts have been made to increase the distance between the teeth of opposite sides by means of pressure exerted directly upon them, such pressure being applied to their crowns or necks. The result of this plan of treatment has been to thrust the crowns obliquely outwards, bringing the fangs actually nearer the mesial line than before, and thus not only placing the teeth themselves at an angle disadvantageous for mastication, but also narrowing, instead of widening the nasal cavity, the expansion of which may be of even greater importance than that of the mouth itself. This has hitherto been the extent of the curative treatment directed to the rectification of these deformities.

After a careful study of the anatomical and physiological conditions involved in contractions of the upper jaw and nasal cavities, I have been enabled to perfect a system of treatment which has more than answered my most sanguine expectations. The general principle adopted is the application of well directed and carefully regulated pressure, not to the teeth themselves, but to the bony structures involved in the deformity, such pressure being steadily kept up for a longer or shorter time, according to the degree of the deformity. All cases hitherto treated, however severe, have yielded to the means employed, and this is scarcely to be wondered at, when we remember the effects of even moderate pressure upon living structures.

The mechanism I employ consists essentially of metallic springs which act on a plain parallel to that of the palate, and produce a sum of forces having a direction from the mesial line of the palate directly outwards, and impinging upon the line of the alveolar arch at right angles to it. The plate follows the curves of the palate so closely, and its thickness is so inconsiderable, that it can be worn with but little inconvenience, and it but slightly interferes with articulation. Mastication is often facilitated by the presence of the plate, which need not necessarily be made visible.

For the rectification of the variety of the deformity in which the teeth project obliquely forwards a slight modification of the treatment is required, although the general principles are the same.

Before leaving the subject I would wish to call attention to a variety of dental irregularities which though frequently co-existing with contraction of the superior maxillary bones yet is often met with independently, and will then demand a different plan of treatment. I allude to those cases in which there is an unnatural obliquity of the upper front teeth causing them to project forwards in an unsightly manner, and rendering them useless for purposes of mastication. The causes of this irregularity are all those which tend to produce arrest of development and to interfere with due nutrition. There is another cause, which has a special influence in bringing about this state of things. That is the habit of biting the lower lip frequently observed in children, and which by constantly repeated, though slight pressure exerted upon the backs of the teeth, causes them to change their position in the partly ossified and yielding alveoli. One of the most noticeable effects of this irregularity is the shortening of the upper lip, which almost invariably accompanies it, and which much impairs the facial expression. The projecting and separated front teeth are brought prominently into view when the patient smiles, and in the more extreme cases they project considerably between the lips, sometimes overlapping the lower lip to a great extent and indenting it by their pressure.

The treatment of this irregularity achieves very definite results and is simple in application. It consists in the adaptation of a rigid plate to the palate and inside of the teeth from which small steel springs of piano wire are brought to bear with a carefully regulated pressure on the displaced teeth. The effect of this plan of treatment soon becomes apparent. In the course of a period varying from one to five weeks, the teeth are brought into their normal position to the great improvement of the appearance, speech and mastication. The unsightly spaces which previously existed between the radiating teeth are removed by their lateral approximation as soon as they are brought back into their right line.

INAUGURAL ADDRESS.*

By P. A. LINNELL, L.D.S. Eng.

Gentlemen,—My first words to-night, must be words of gratitude. I thank you most heartily for the honour you have conferred upon me in electing me your President.

Seven years ago, when I was one of the Students principally interested in the formation of this Society, I little thought that in so short a space of time, I should be raised to the dignity of occupying the presidential chair.

I feel the honour all the more as this is the first time in the history of the Society, that a past Student has attained the distinction; and it was with great hesitation, and great reluctance, that I accepted the office, as I felt there were others older and more experienced than myself who could have directed you, and guided you in your affairs far better than I can hope to do.

But, as I am here, I hope you will bear with me in my many short-comings, and I trust with your help, and the help of our two excellent secretaries, to discharge my duties satisfactorily, so that this session may prove as interesting and profitable as any of its predecessors.

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* Read before the Students' Society, Victoria Dental Hospital, Manchester.

It is, to me, a matter for great congratulation, that when I take up the reins of office, I find the Society in such a flourishing, and efficient state. This is a condition of things over which we can all rejoice, and especially those who were the originators and founders of the Society. Being one of those who had a large share in its formation, I have naturally taken a deep interest in its welfare and progress, and have watched with much pleasure, the rapid strides it has made within the last few years. When I look back to the early days, and think of the many hours we spent in arranging for its proper constitution, I feel, on looking round to-night, that that time was not spent in vain.

Since the first meeting which was held on October 7th, 1886, when only a handful of members were present, we have steadily progressed, until now, our gatherings are largely attended, both by the students and the members of the hospital staff.

The name of Mr. Leopold Dreschfield will always be remembered in connection with our early struggles. For four consecutive years, that gentleman presided over our meetings, and helped us in every way to make the society a flourishing Institution in the Hospital, and we can only regret the incident which caused him to sever his connection with us.

Whilst calling to mind the active workers in those days, we must not forget the name of Mr. Thos. Jackson, the indefatigable secretary, who summoned us to innumerable council meetings, and threw his whole heart into the work.

From time to time, individual generosity has done much to help us on, and increase our capacity for usefulness. One of the first to step forward in this way, was the then lecturer on Dental Surgery, Mr. Leonard Matheson, who by his liberality in presenting a number of books to the Society, formed the nucleus of a library which has since increased, and developed into a most excellent collection for studying or reference.

To be able to refer to a number of standard works, has proved a great boon to all members, and I would ask any past student who has received this benefit, to show his sense of gratitude by presenting a copy of some book to the Society.

Our next step forward was the formation of a museum, which is gradually attaining large dimensions, and assuming a most interesting character from its varied collection of instructive and curious specimens.

Our space for the storing and exhibition of these treasures, is at present very limited, but I hope, when the proposed new hospital is built, we shall have a suitable room, with glass cases in which to display them to advantage. In the mean time, I can only appeal to all those interested in its welfare, to send contributions to it, in order that we may have a good show when the time comes. All gifts are labelled with the names of those presenting them, and the Curator will be most happy to receive and acknowledge any such contributions.

Past students have from time to time sent casual communications to the meetings, and these have been much appreciated not only from the value of the contribution, but by showing that these men, although they have gone to practise in distant towns, have not forgotten their *alma mater*.

During the last year or two, many most excellent innovations have been organized, greatly adding to the value and importance of such a Society as this.

We have been honoured by having emminent professors, and surgeons from Owen's College and the Royal Infirmary, to read papers at our meetings, thereby giving us the advantage of their knowledge in some branch of our speciality of Surgery.

The last, and by no means the least advance, was the publication last year of our transactions, which now, with a special editor, may be looked forward to, as forming a substantial record of our proceedings.

In the session on which we have just entered other new departures are about to be tried. You will see by the syllabus that a clinical night will be held, and I feel sure this will prove most popular, as our profession is one which is of such a purely practical character, that one demonstration is worth many papers.

The introduction of the microscope to our monthly meetings, when some special subject will be dealt with, will no doubt prove of great interest and value to the members, and I hope this will stimulate all of you to make an effort to bring sections bearing on the matter in hand, as it is by this collective investigation, that much new light can be thrown on the subject, and many new points disclosed. There is no doubt that a large field is open in this direction, and although we cannot all hope to be discoverers of scientific facts, it is nevertheless a good training to accustom ourselves to habits of accuracy, of careful observation, and of clear record of those conditions which come under our notice. If you will all try and cut sections for yourselves and bring them here to be examined and criticised, the case for holding microscopical slides presented to the Society by Mr. George Campion, one of our late presidents, will not long remain empty.

In cutting sections, as in any other work, failure and disappointment will no doubt attend your first efforts, but by persevering, the difficulties will soon be overcome, and you will be rewarded by obtaining successful results.

Charles James Fox was accustomed to say that he hoped more from a man who failed, and yet went on in spite of failure than from the buoyant career of the successful. "Show me," he said, "a young man who has *not* succeeded at first, and nevertheless has gone on, and I will back that young man to do better than most of those who have succeeded at the first trial."

The question box which will be on the table at every meeting, will no doubt prove a means of affording much information and interchange of ideas on many, and varied subjects. The questions being asked in this way will enable a member, however retiring, to bring forward any matter for discussion on which he may desire to hear the different views of those present.

I trust now that all of you will attend these meetings, which offer so many inducements, I feel sure you will never regret the time spent at them, for in addition to the large amount of information to be gathered, they prove a means of social intercourse among the members, where friendships may be made, and it is hoped retained in after life, and by this means lead to a better relationship between members of the profession than has hitherto existed, a consummation devoutly to be wished for.

After this short sketch of the birth and progress of our Society, I come to another stage of my address, one you will be glad to hear, on which I shall not dwell long.

It is, I know, the custom and the privilege of the president on occasions such as these, to offer to the young student who is just entering his professional career, words of advice, or words of warning, that may help, and direct him to pursue, both during his student days, and in his life afterwards, that honourable path of duty which will lead him to become a successful practitioner as well as an ornament to the profession.

But I can hardly pose as a moralist to you, as I am barely past the threshold myself, at the same time it seems to me there is one thing we can all strive to do, and that is, to use our greatest efforts to guard the privileges we possess, and which have been obtained for us only as the result of much hard work, and much time spent ungrudgingly by our predecessors.

It is only by doing our utmost to protect these privileges that we can show our appreciation and gratitude to these men. The foresight and energy of these unselfish workers has created a recognized and honourable profession, and we become the inheritors of this estate which is placed in our hands to cultivate, and to hand down not only unimpaired, but improved, to our successors.

When you have obtained your diploma, one of your first acts ought to be to join the British Dental Association which has for its chief object the maintenance of the honour and interests of the Dental profession. But you must not imagine that by becoming members of this body that you have done everything, and that your responsibilities cease. It is an excellent thing to have laws, and associations by which we can be properly governed and our interests watched, but it is a mistake to think that this will do all unless we ourselves make some effort, and endeavour by our own character and bearing, to show those with whom we come in contact, that the dental profession is not now solely composed of blacksmiths, barbers, or sequahs. It is by each one trying to elevate, and improve himself, that the whole profession is elevated and improved ; all progress is the sum of individual industry and energy, as decay is of individual idleness and selfishness.

I will not weary you any longer with my remarks, I know you are all anxiously waiting to commence the more interesting portion of our programme this evening. I can only say in conclusion that I hope I shall have the pleasure of meeting you all here month by month, and that we may spend many profitable and pleasant evenings together, and when in after years you look back to these days, I hope you will all be able to say—I never regretted the time spent at the Students' Society of the Victoria Dental Hospital of Manchester.

THE DENTAL CAUSES OF NEURALGIA, AND THEIR APPROPRIATE TREATMENT.*

By Mr. H. B. Rowe.

Mr. President and Gentlemen,—Under the above heading I intend simply to give the various dental causes and appropriate treatment of neuralgia, and therefore shall not enter into the various definitions, symptoms, course, &c., of the disease. But it may be as well to remark that Odontalgia and Dental Neuralgia are very intimately associated, the former merely, and always, being the primary cause of the latter. They are so closely connected, in fact, that although in Dental Neuralgia the pain is so severe that the neighbouring parts are affected, and it becomes impossible to point out the real cause, yet, nevertheless, the primary cause is always present.

It will therefore be seen that almost any dental irritation may produce the disease.

Dental Causes.

They may perhaps be classed under:

(*a*) Exciting—Toothache.
„ Exposure to cold.
„ Pressure or irritation of nerve trunks (developing wisdom tooth, for instance.)
(*b*) Predisposing—Hereditary tendency to caries and Neuralgia.
„ A low state of health.

Of the predisposing causes there is little or nothing to say; the teeth should be kept scrupulously clean, likewise the mouth, and frequent visits should be paid to the dentist for the purpose of examination, also for the treatment of caries, should any exist.

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* Read at the Students' Society, National Dental Hospital

Exciting causes may be said to be as follows: —

1.—Irritation and chronic inflammation of the pulp.

2—Exposure of sensitive dentine.

3.—Decomposition of confined matter in the pulp cavity, leading to alveolar abscess.

4.—Alveolar Periostitis, probably caused by alveolar abscess, or absorption attacking roots of teeth.

2.—Secondary dentine in the pulp cavity.

6. Developing or misplaced wisdom tooth.

7.—Exotosis.

These may be said to be the chief causes of dental neuralgia, and it is by their treatment that the disease is removed.

TREATMENT.

This lies in removing the cause and relieving the pain, and it very often happens that the former is all that is necessary, the pain disappearing immediately on its removal; but should the patient have suffered from very severe paroxysms, it will be necessary, as well as advisable, to give tonics of some description, and a few of these most commonly in use I will mention later on.

In looking for the cause the first thing to do is to thoroughly examine the mouth on both sides, but more especially on that side where the neuralgia is, as the disease is as a rule unilateral. Presuming that there are no cavities in the teeth in such a position that they may be plainly seen with a mirror, a probe should be taken and interstitial cavities sought for, also any that might be situated beneath the gum, or on the distal surfaces of molars. Cavities situated in a position where they can be plainly seen should not be probed.

Caries not being present, the following tests should be tried. All the teeth should be tapped separately, to test the condition of the roots. They should be treated in a similar manner, by getting the patient to bite on a piece of thick card, each tooth being tried in turn. A jet of cold water, and afterwards, a very hot burnisher, should be brought to bear on each tooth in succession, and all fillings should be tested by prolonged contact with a hot burnisher. All roots should be very carefully examined, especially if loose or necrosed, and all tartar removed.

These failing, the history of exostosed roots on any teeth previously extracted, and the absence of any teeth in the series which might give rise to trouble through non-appearance, should be enquired into. Pain is a symptom, also, the locality of which, to a great extent, shows the position of the cause ; for instance, when the pain is felt in the parietal region, we may safely say that the cause lies in the back of the upper jaw, or when it is felt in the ear, or in front of the ear, or down the neck, we know the trouble is situated in the lower jaw. Again, when the pain is felt on the face, the cause may be situated in any part of the upper jaw.

By carrying out the above rules and closely following the result, some cause may generally be found to account for the presence of the disease.

The removal of the causes resolves itself into treating the above mentioned exciting causes, and these I will deal with as briefly as possible.

1,—The treatment in chronic inflammation of the pulp, is to thoroughly expose and apply arsenious dressing, subsequently removing the pulp, and filling the tooth. A difficulty, however, lies in the fact that one does not always get the exposure in a position readily accessible ; the cavity, for instance, may be situated on the distal surface of a second molar near the gum, the crown of the tooth not being carious, and the teeth very close together, for this is the sort of situation in which chronic inflammation is most likely to cause neuralgia. In a case like this, one would either drill through the crown of the tooth into the pulp cavity, the patient being under the influence of an anæsthetic, and so treat the tooth, or else extract. This is the most common cause of dental neuralgia

It may be said that acute inflammation of the pulp is not, as a rule, present with neuralgia, a localised and a general pain seeming to stand in a complementary relation to each other.

2.—Sensitive dentine is found round the necks of teeth, and on surfaces exposed to friction. The treatment is the application of some caustic to the surface, such as nitrate of silver. This is presuming the depression is not large enough to form a cavity and to take a filling.

3.—An alveolar abscess may arise in connection with any of the teeth, and under this head, would come abscess of the antrum, due to the teeth; the treatment is to at once open up the tooth and give free exit to confined matter, using antiseptics and loose dressings for some time before permanently filling. If the abscess is far advanced, or in connection with roots, or with the antrum, extraction is the proper treatment to adopt.

4.—In alveolar periostitis, caused by alveolar abscess, or absorption of roots, the treatment is extraction. All unhealthy, loose, or necrosed roots, should be removed, likewise all tartar.

5.—Secondary dentine in the pulp cavity, is a condition difficult to diagnose, for the tooth may be perfectly healthy to all outside appearances; pressure, or a hot burnisher applied may cause uneasy symptoms. Treatment is either to extract, or to open up the tooth under an anæsthetic, but the pulp is difficult, sometimes impossible, to remove.

6.—In developing and misplaced wisdoms, we have little save the pain to guide us, this may be very severe in the parietal region if an upper; or, if a lower, the pain will be felt in the tempero-maxillary region and in the ear. Closure of the jaw may also take place. In this condition, one commonly gets the pain referred to the bicuspids, owing to pressure on the nerve trunk, caused by the developing roots of the wisdom, the pain being felt at the spot where the nerve makes its exit through the bony foramen. The treatment is to *always extract*; if impossible to remove the wisdom, the tooth in front must be sacrificed, to give it room to come forward.

7.—Exostosis is another condition exceedingly difficult to diagnose in its earlier stages, there being, possibly, nothing whatever to show that the tooth is diseased; pressure is the means adopted for detecting its presence. The disturbance is usually constitutional, and the treatment is to extract.

To relieve pain, various tonics are given, and I will briefly touch on a few of those most commonly used.

The one, perhaps, most heard of is Sulphate of Quinine, which should be given in large doses, from 5 to 10 grains for an adult, shortly before the time at which the neuralgic attack is expected, and in dental neuralgia it usually comes on at night. It is an advantage to give a saline purgative about an hour and a half before administering the quinine.

Morphia is a great reliever of pain, subcutaneously injected, one eighth or one quarter of a grain being quite sufficient at first.

Croton Chloral Hydrate is very valuable in neuralgia of the fifth nerve; it should be given at night in doses of from 5 to 10 grains dissolved in warm water.

Chloride of Ammonium is greatly used by some people; the dose is from 5 to 10 grains, at short intervals.

Gelsemium is found to be very good where there is no local lesion, the dose being from 10 to 20 minims of the tincture. It may also be used as an external application.

In conclusion, gentlemen, one should always extract teeth in dental neuralgia under an anæsthetic, especially where there has been severe pain, the extraction being quite sufficient to bring on a severe paroxysm, and these cases mostly include those where one hears of extraction causing neuralgia.

I thank you very much for your kind attention, and hope you will forgive all short-comings, a great many of which I know only too well, are present.

NEW PHYSIOLOGY.

Dr. Jezek, of Berlin, has written a book to show that the ordinary views with regard to the circulation of the blood, are not correct. He thinks he has proved the pulse wave does not depend npon the action of the heart, but on the difference in pressure due to the periodical diminution and increase in the diameter of vessels. He is of opinion that the lungs, by inspiration and expiration, cause an alternating change in calibre of the pulmonary vessels, so that the blood is pressed into the left side of the heart and the arteries by the lung when distended with air. The simultaneous rise in pressure in the veins, causes the blood to flow into the lungs when they shrink in expiration. The usually accepted teaching is that as the capacity of the chest is increased during inspiration, the pressure outside the heart and great veins is diminished, thus tending to draw the blood into the thorax, and so assist the circulation. Ordinary expiration does not influence arterial tension much, either way.

British Journal of Dental Science

LONDON, DEC. 1st, 1892.

AN IMPORTANT DECISION.

It is but four weeks ago since we dealt, upon this page, with some aspects of the lamentable condition of things connected with the carrying on of practices by unregistered men. We knew, at the time, that matters were working together in a direction which gave grounds for hope. Our anticipations are realized, and we are glad now to call our readers' attention to the latest development, from a dental point of view, of the good work accomplished by the General Medical Council. It is, indeed, a matter of importance, and is another link in the chain, which, so far from shackling the honourable practitioner, should rather be considered as a secure cable, destined to anchor him in the haven of public esteem, and of recognition by his medical colleagues. Not long ago, the General Medical Council recognised the incongruity of any longer allowing a back door to the Dentists' Register to remain open, whilst the legitimate entrance was free to all on the production of a diploma, the ordinarily accepted proof of fitness. Admission under Clause 37 of the Dentists' Act, was thereupon suspended. The present step is a logical sequence and a necessary corrollary to the last. If unqualified men are not worthy of a place upon the Register, they are not to be permitted to practise as if they were.

At the recent session of the Council, the Solicitor, who had been requested to report on the question, expressed his opinion to the effect that it was as much the duty of the Council to protect the public in the matter of dentistry, as to protect it in the matter of medical practice. A statement with regard to certain cases of "covering," led him to advise the Council to issue a similar warning to dentists, as had been done in the case of medical practitioners. The Executive Committee had already passed a resolution that the Solicitor should be directed to prepare a draft warning, analogous to that given to registered medical practitioners in 1883, and Sir WALTER FOSTER proposed that the report be adopted. It was carried without opposition. Although the account of the proceedings published in the medical Journals does not mention it, we believe that Sir RICHARD QUAIN, the President, pointed out that unless the draft was submitted to the Council during the present session, the warning could not be issued until next year. This was accordingly decided upon, and our readers may expect to receive the official notice before long.

With regard to the practical outcome of this important decision, it is difficult to speak of its far-reaching effects at a first glance. But, remembering what has taken place in medical practice, it is possible to foresee that it will form a weapon, which, when properly made use of, and in no other way, must make for progress and improvement. We would caution the over-zealous and too hasty ones, that any immature application of the new rule, will probably result in disaster, but after the necessary preliminary skirmishes and acceptance of pleas of ignorance, the regulation with regard to "covering" in dental practice, will be found to do much to purify the profession. A certain section of registered dentists, whilst accepting the advantages, prefer to use them in such a commercial spirit as would, if largely imitated, convert an honourable profession into a close corporation of capitallists and "sweaters." Under such views, the necessity for the prevention of disease is apt to be regarded from a purely sordid aspect, and hu man suffer ing must be relieved with the avoidance of an unprofitable celerity. The decision of the Council helps forward the sure, if somewhat slow, elimination of the unfit. The straightforward and successful practitioner is not debarred from obtaining the help of assistants, or of engaging a *registered* man to take charge of a branch practice. We may imagine that the employment of unregistered men in surgeries, will for some time longer be considered permissible, provided that they are merely regarded, to use a legal definition, as "the ministering hand of a directing brain." But where, through the impossible simultaneous presence of the principal in diverse branch practices, or where the owner of the "directing brain" would seem to be a peripatetic commercial traveller, restricting his intellect to the investigation of accounts and the reception of cash balances, then the ministering hand must have his name upon the Register and remember that he is accountable to the General Medical Council for proper professional conduct, and modes of practice.

We regard with much satisfaction the evident tendency on the part of the Council to pay attention to the legitimate demands of dentists. Sir JAMES CRICHTON BROWNE has recently pointed out that if it is true there should be no taxation without representation, then there should be a dentist on the Council The dentists are evidently not without friends in the Medical Parliament, and the latest action of that Body goes far to show that it is doing its best under many difficulties, amongst which may be mentioned a plethora of work and a want of time to devote to it.

ASAPROL.—This is another addition to the already long, and constantly increasing, list of antiseptics. It is a white powder derived from naphthol, and dissolves readily in cold water. As quoted in the *British Medical Journal*, a continental observer, Stackler, found it very successful in cases of influenza, where there was much fever and pain which had not yielded to quinine and antipyrin. There were also good results from its use in gout, rheumatism, asthma, tonsillitis, and various infective conditions. The dose for adults should commence with 2 grammes for the first day, and then gradually increase to 3, and 4, administered with plenty of water for elimination by the kidneys. Asaprol is incompatible with alkaline iodides, sulphates, and most of the alkaline salts. It is, itself, a calcium salt.

THE HERBST METHOD OF TREATING PULPS.—According to some observers the long-hoped-for day has come when we may conscientiously leave root-canals to look after themselves. We remember hearing, some few years back, of the wonderful properties ascribed to cobalt by Dr. Herbst. But we are also under the impression that somebody analyzed a sample and found that the substance was principally arsenic. Certainly a single application of arsenious acid does not always devitalize the whole pulp, and the Herbst method consists in removing the soft tissue as far as the entrance to the canals, with antiseptic care, and then burnishing a tin or gold floor on the bottom of the pulp chamber. We publish elsewhere an abstract from a paper written by a well-known practitioner in New York, who apparently, after vigorously opposing the method, has become a convert. His communication met with sharp criticism in the discussion which followed. It has also afforded an opportunity for an editorial protest in one of the Journals, the writer of which amusingly says that he is unable to see much difference between the "new method," and the slovenly operations of indolent or ignorant operators everywhere, especially in England and Germany!

THE USES OF ARTIFICIAL TEETH.—It is a matter of common experience that the motives which induce people to adopt the use of artificial teeth, vary considerably. A well-known class of patients are concerned from the æsthetic point of view, and to say nothing of an element of vanity, charitably think that other people must be no longer exposed to the shock of their appearance. Some of these would be quite satisfied if the front of the mouth were attended to, and trouble themselves little about molars for masticating. Others again, physiologically inclined, are very strong upon the latter point, whilst a third contingent, who have to face audiences, find the benefit of an artificial denture in the production of voice sounds. According to a statement in the *Lancet*, an experimenter, who has been swallowing cultures of the comma bacillus, is seventy-four years old, has not a single tooth in his mouth, and only uses his artificial teeth when he has to make a speech, "not needing them for mastication." According to another report, appearing in the public press, a worthy missionary was lately contrasting the happy lot of civilized races compared with the darkness of heathen lands, when the speaker's denture dropped out in the midst of one of his most telling passages. The account says that there was much amusement, but we are glad to find that the teeth were replaced, and the peroration brought to an end. When the heathen have become properly civilized, they will doubtless require artificial aid in mastication, but by that time a constant fit of such work will possibly be provided for.

PRELIMINARY EXAMINATIONS.—Some critics are especially severe upon the injustice of allowing youths to enter upon the study of a profession unless they can prove that there is a reasonable probability of their being mentally equal to the work demanded. The Preliminary Examinations, to some extent, sift out the suitable ones from the failures, and according to a recent writer, the College of Preceptors last year rejected 357 out of 491 candidates. The announcements of the American Dental Colleges, do not afford much information as to what is required, some being discreetly silent, others referring to an examination in the ordinary English branches, or, in addition, to the writing of an essay as a test of orthography and grammar. And yet, no doubt, in spite of such wise precautions, there are many would-be practitioners anxious to take upon themselves the onerous duties of a professional life, as the two following letters testify. The first came to hand in London from the Midlands; the second is quoted from an American source. "Dr. Doctor having had your name given to me, as likely to put me in the way of obtaining my Dental Diploma or registratur without going through College course. I entered the profession in 1881, if so, shall be pleased to hear from you, Yours Respectfuly———" "Dear Sir—I Am in Want of a Little Information i Want To no if There is Any Way for me To Get a Diploma to Practice Medicine By Attending Only One Term I Will Say That I amas Competent to Practice Medicine Now as More Than One Half of the Doctors & I Have Prescribed More or Less for 10 years as I Have Bin in The Drug Business all of My Life I am now 30 years old, and I Would Like To Graduate so I Could Go Down in The Nation and Practice as Thare is Money in it Down Thare You Let me Hear from you & Let me Know Just what it Will Cost Me & What Time it Will Take & When Your Term Commences & What Books I Will Want I Have a First Grad Pharmsutial Certificate in The State & Have Had for 5 Years Hoping to Hear from You in Details by Early Mail I Remaine Very Truly Your——

"PS if You Cant Do Any Thing for Me Please Let No What ollege Can if you Please & oblige."

THE GENERAL MEDICAL COUNCIL'S WARNING.—The following is the caution about to be sent to every dentist on the Register:—"Any Registered Dentist practising for gain, who knowingly and wilfully deputes a person not registered or qualified to be registered under the Dentists' Act to treat professionally on his behalf in any matter requiring professional discretion or skill, any person requiring operations in Dentistry of a surgical character, will be liable to be treated as having been guilty of infamous or disgraceful conduct in a professional respect, and to have his name erased from the Dentists' Register."

Abstracts of British & Foreign Journals.

ELECTRICITY: ITS APPLICATION IN DENTAL PRACTICE.

By Albert C. Westlake, D.D.S.

Electrical force, like light, is everywhere being generated and everywhere acting. The play and interplay of electrical phenomena are incessant and infinite. We see in electro-physics many illustrations of the transmutation of one force into another. If we start with heat, we find it produces electricity, and through electricity produces chemical action, manifesting light. If we start with magnetism, we find it produces electricity, heat, chemical action, and light. If we start with chemical action, we find it produces heat, light, and electricity. If we start with electricity, we find that it produces magnetism, heat, light, and chemical action and motion. The basis of all electrical measurement is Ohm's law, which is, that the current passing through any point in a circuit, varies directly as the electro-motive force and inversely as to the resistance. We may illustrate this law by supposing a current of water passing through an ordinary syringe. The quantity of water that flows through the tube will be directly proportioned to the force with which it is urged forward by the piston and inversely as to the resistance offered its passage. So in electricity the useful effects of the electro-motive force are diminished by having to overcome resistance both of the source itself and the conductors it traverses. The unit of electro-motive force is called the "volt," after Volta, the Italian philosopher; the unit of resistance is called "ohm," after Ohm, the German mathematician; and the unit of current strength is called "ampere," after the French philosopher. The unit of resistance divided into the electro-motive force equals the ampere or current. These three main laws are the standards governing electrical measurement in fixing a battery and circuit.

Electricity always moves from the higher to the lower potential. To transfer heat from one substance to another, those substances must be of different temperature. It is so with electricity. To introduce a current, it is requisite that the two points to be united by any conductor shall be of different potential ; as an illustration, the positive and the negative pole. Suppose we consider the centre of a box from which the current is transmitted, zero ; then the positive pole will be plus (+) and the negative minus (—). We assume the difference of potential, or the power of overcoming resistance between the poles, to be 100 units. The potential at the positive we will say is + 50, and that of the negative — 50. With the poles in a patient's hands, the potential will fall regularly along the resistance from the positive pole, and rise regularly from the negative pole, until both meet in the centre of the resistance of the body. The centre of resistance in the body is not necessarily an anatomical centre, as the resistance of the different parts may, and does, vary. This point is illustrated in the position and extent of the body between the electrodes. When one electrode is held in the patient's hand, and the other applied to the tooth or gum, the resistance to the current by the body is of course greater than if the electrodes were close together.

At our present stage of experiments, we assume that it takes twenty times more pressure to overcome the resistance in the tooth than in the soft tissue. The conductivity is also modified by age, temperament, and the nature of the disease. Hence, greater quantity is used for one advancing in years over a young person, and a lymphatic and bilious temperament over a nervous or sanguine. It is quantity that decomposes chemical substances as water, salts, &c., and that accomplishes by its proper regulation, the therapeutic effects. Electricity does not by its direct action, leave any more electricity in the body than it finds there. If it increases or diminishes the natural electricity of the body, it is indirectly through the effect of the properly regulated current passing through the tissue and improving nutrition. The length of the application is also to be considered ; also the differential action of strong, medium, or feeble currents.

The difference in the conducting power of electrodes is considerable. A metallic electrode conducts much better than a sponge , flannel conducts better than a sponge, but not as well as a metal. A current that is painful when applied by a metal, and quite perceptible when applied by a flannel or chamois skin, is hardly noticeable when applied by a sponge. The painfulness of a current is modified by the extent to which the current is diffused. A large, broad electrode will conduct more than a small, narrow one. The external resistance depends also on the quantity and quality of the liquid used to moisten the electrodes. Warm water adds to its conductivity, and warm salt water best of all. Under firm, close pressure, the conduction is better than with light contact.

In our dental practice the object is necessarily localised electrization, which is accomplished by placing the electrodes so that the current in passing from one to the other, shall chiefly traverse the particular part that is to be affected, so far as we can control it. The effect of both the faradic and galvanic currents, however, extends directly, or by reflex action, to parts beyond the circuit. These currents have often been confused in their physical and physiological effects. They are, of course, the same force, electricity, only a difference in potential and quantity. For either to be applied successfully, the operator must be competent to diagnose or decide which to use. Thus, if merely an intermittently contractile (or simulative) effect on muscle is desired, the use of rapidly interrupted current at high pressure (such as is obtained from the secondary wire on a faradic coil) is indicated ; while if a cataphoric effect is desired, a current of volume is necessary. The operator must also have the current under complete control in both pressure and volume.

The author is convinced that the problem of obtunding sensitive dentine will be solved through the agency of electro-medication or cataphoresis. This theory, as applied to other tissue, was promulgated by the French scientists, fully fifteen years ago. His own experiments in this line are, at present, not very extensive, but the favourable results obtained, encourage the hope that after the differential actions of the two currents on the bone are thoroughly understood, and the decision made as to the drug or drugs to be used, the pain that patients experience when a cavity is being prepared will be reduced to a minimum. If the positive and negative poles are brought in firm contact on the gum at both sides of the root or tooth to be extracted, the end of these electrodes being in the form of a cup or saucer, within which is placed sponge or cotton, saturated with a four or six per cent. solution of cocaine, or absolute alcohol, ether and chloroform combined, or some other properly selected vegetable anæsthetic, and the current turned on gently to the required degree, this preparation can be forced into the tissue sufficiently to cause local anæsthesia. The galvanic current required, is from two to thirty milliamperes. The author reports a few experimental cases.

The Dental Cosmos.

WHEN AND HOW TO FILL ROOT-CANALS.

By Rodrigues Ottolengui, M.D.S. New York.

In discussing the actual filling of root-canals, it is essential to consider, at one and at the same time, the condition of the tooth and the methods of filling its canal ; for despite the fact that many skilled operators have but a single method of treating all roots, it is wiser to be guided somewhat by the state of health presented.

Gold at one time was counted the only true material for filling a canal. If the tooth needed gold in the cavity, it also needed this precious metal in the root. The method adopted was to twist a rope of foil stiff enough to allow of its being forced into the canal, and yet soft enough so that it could be condensed thereafter. The method condemns itself for it is apparent with but a moment's consideration that wherever the foramen was large the rope would be forced through, with the probability of causing future irritation and abscess. This is true of other materials, but in a less degree because of their plasticity.

Lead has been used considerably, and by some it is claimed that it exerts a therapeutic effect. It is used in a single cone. trimmed to shape with the knife, and driven into the root. The same accident of passing through the canal may occur, and again it may be wedged into the upper part of the canal without reaching and filling the foraminal end.

Within recent years it has been taught by some that a most excellent way of filling a root-canal is to trim the end of a stick of orange or other wood, and after dipping it into some germicide drive it into the canal, leaving it there. Once more we find the material driven through the canal end ; and even where this does not happen, abscesses are common. Then, when it is imperative to remove the canal filling, the operation will prove most trying. The wood splinters, so that it cannot be withdrawn with forceps, tweezers, or pliers, whilst a drill simply tears it to shreds which are still more difficult of removal.

Next to wood, the author thinks cotton the most despicable thing to leave permanently within a tooth-root.

The cements, so called, including oxychloride and oxyphosphate, must of course be relied upon in setting crowns, and therefore if they serve in those cases it follows that they must be reliable in any. This, however, must be modified, for where a crown is set, the canal is usually enlarged so considerably that the cement is readily carried to all parts of the root. Where the neutral crown is still in place, it might not always be possible to thoroughly fill the canal with such a plastic material. Some claim that oxyphosphate lacks the virtues of oxychloride, but the statement, however authoritatively asserted, would be hard to prove. There is one objection to either which is important. It is difficult to remove them, should it be desirable to empty the canal.

Gutta-Percha in some form, is used by the majority of dentists, and rightfully so. The usual custom is to roll the white variety into cones, which are slightly warmed and pressed into the canal. Chloro-percha is most useful when not relied upon alone. Forced into a canal and followed with a cone, it renders the operation of filling oftentimes more easy and more perfect.

The first condition in which a tooth requires root-filling is where the pulp is freshly removed. Here several phases obtain.

The pulp may be removed fully, coming away so that the operator is thoroughly satisfied that there is none left behind. Here is the ideal place for immediate root-filling. Where the canal is accessible, there is no need for a reamer ; but if it be attenuated or irregular, the reamer is to be cautiously used. The dam being on, use a hot-air syringe, drying the cavity thoroughly, continuing the blast until the patient complains of the heated condition of the tooth. Then insert a cone of Gilbert's temporary stopping, previously dipped into chloro-percha, and force this up into the canal. In a stiff condition it is more readily forced into place, and the heated walls soften it sufficiently so that it is easily packed to the end. This, however, should be done with the utmost care, and the slightest expression of pain from the patient, such as wrinkles between the eyebrows, is a sign to stop. It is a danger signal which, when obeyed, may prevent pressing the material through the apex.

For temporary root fillings the author recommends waxed floss silk dipped into chloro-percha and cut into pieces an inch long. When dry they form gutta percha cones which have a silk through them.

They are readily packed into a canal, and the end being allowed to extend beyond the orifice of the canal, is readily grasped, in case of need, with a pair of tweezers, whereupon the whole root-filling is easily withdrawn. Where no trouble ensues, the root-filling of this kind may safely be left in place, being quite dissimilar from cotton, as the silk fibre is thoroughly incased in gutta-percha.

The next condition is where the pulp has died without the aid of a dentist, and the patient presents with a pericementitis. The treatment is to abort the disease if possible, or in case this fails, hurry it on to the suppurative stage. Where the pericementitis seems to subside without suppurating, the silk and gutta-percha cones should be used, because of their easy removal.

In teeth presenting with abscesses, if the abscess is acute, it is wiser to cure it before filling the root, except where the tooth is single-rooted, and it is decided to amputate the apex and remove it with the abscess attached. Then it is best to fill the root at once, so that the amputation will not leave an empty canal with a gaping opening at the end. These teeth should be filled with the temporary stopping packed solidly into the root. The amputation is accomplished thus: Select a spear-drill, and with it pass through gum, process, and root, along its central axis as high up as is decided for the amputation. Follow this hole with a sharp fissure-bur, with which by laterally cutting first one way and then the opposite, the end of the root is easily severed. Where there has been much destruction of the process, its removal will not be difficult. Where, however, this has not occurred, as, for example, in a cuspid where there is a long root and dense alveolus, it may be so difficult to do this that it would be wiser to anæsthetize the patient. Then the labial plate of the alveolus may be removed with burs and the amputated root-end extracted.

In chronic abscesses the author scarcely ever treats other than surgically, so that immediate root-filling is more permissable here. Still, he prefers the silk and gutta-percha in all cases where there is the least chance that some day this must be removed.

While it is true that we should hope to make our work as permanent as possible, in the matter of root-filling, too positive permanence is a detriment rather than an advantage. It never can be certainly asserted of any tooth that its roots will never need to be unfilled. If in no other way, the natural crown may continue to decay till it is lost, when a crowning process may make it imperative to empty the canal or canals. Where they are found filled with a very resistant material, there will always be some difficulty experienced. Again, teeth have been lost, where pericementitis had set in, which could not be adequately treated because the root-canals were so filled that they could not be emptied, the teeth being too sore to the touch to make the necessary drilling possible. When such a case presents the dentist will quickly say to himself, "I wish this root were filled with temporary stopping, which I could remove with a heated instrument." The other method, using the silk-and-gutta-percha cone, is satisfactory.

Either of these methods require that at least a slight layer of oxyphosphate or oxychloride should cover them before gold is packed upon them. This will be unnecessary where amalgam is to be depended upon.

The Dental Cosmos.

THE FIRST PERMANENT MOLAR.

By Dr. J. H. Woolley, Chicago.

At the time the first permanent molar is calcifying, there are phsyical causes at work to disturb its harmonious growth and development, springing from diseases of childhood. We are also to consider that we are living in an age of ceaseless activity. All are pushing to the front and forcing themselves to the highest tension, and children brought into this world under such conditions inherit a highly nervous organization. When we consider that the most rapid growth of the brain takes place before the age of seven (according to many physiologists), we find it growing at the expense of the other organs.

Not only the bones of the body, but the teeth suffer from this rapid development of the nervous structure. When we consider all these facts, together with the brain-forcing the child receives, it is not strange that we see diseases of childhood occurring to retard its proper physical development, and that of the teeth naturally included. Neglect, caused by ignorance on the part of parents, who think these teeth belong to the first set, plays a prominent part in this early destruction. These teeth appear at a time when many of the temporary set are decayed and the mouth is in a condition to help along any predisposition to decay. If parents were all informed as to the time of eruption of the first permanent molar and would place their children in the care of a competent dentist, a large majority of these teeth could be saved. Having thus considered the causes at work to prevent a perfect development of the first permanent molar, let us now pass to other phases of the subject.

Considering the circumstances under which they have erupted, there are many who believe them to be short-lived, but they also believe they should be preserved until the time when the twelfth year molar first makes its appearance. There are many who believe that these being lost at so early an age are consequently more liable to decay. They claim that the time of life when these teeth are erupted, and the condition of the mouth, etc., are the reasons why these teeth are lost at an early age. It is said that space is gained by the removal of these teeth which prevents the remaining ones from decaying, and that in case of irregularities, and a crowded condition of the teeth, their removal will give room for the proper replacement of the remaining teeth. The author answers these objections and tries to show some of the reasons why so many of the first permanent molars are lost.

About the time the central incisors are shed, four new teeth appear. They are the first permanent molars. As before said, they appear at a time when many of the first teeth are still in the jaw ; and through carelessness, or inattention on the part of the parents, they are overlooked, or if noticed, they are supposed to belong to the temporary teeth ; consequently it is only when the child is suffering from the tooth-ache, that it is brought to the dentist. The teeth may be slightly decayed, and the dentist fills them. Now the child at this age is difficult to manage, if dental operations are to be performed. Many dentists prefer not to have children under their care at all, and when they are obliged to take charge of such cases, they hurry through their operations. What is the result? They are usually imperfect and sometimes a complete failure. Besides, the parents' sympathies are enlisted in behalf of their children, and the dentist is encouraged to believe that if the operation does not prove a success he will not be blamed. These considerations are unworthy of the man professionally and morally. He has shirked his responsibility of educating the parents in regard to the care of their children's teeth, and believes it is of little consequence whether they are saved or not, after the twelfth year molar is erupted, as the latter takes its place.

By the extraction of the first permanent molar it is claimed that more room is given for the bicuspid and cuspid teeth to move back, and that the spaces thus made render the teeth less liable to decay. It is urged that the twelfth year molar will take the place once occupied by the first permanent molar. The author has rarely seen that the bicuspids have separated enough to prevent their decay. He has found, as others have, that, when the first permanent molar has been extracted, it made very little difference in regard to the decay of these teeth In regard to the extraction of these to correct a crowded condition of the arch, and particularly of the front teeth, he says that according to the laws that govern the movements of the teeth they always move forward and rarely backward. There may be cases where necessity demands it but the first permanent molar should not be removed to correct deformities. It is true that irregularities of the teeth are necessarily caused by lack of room in the jaw for them to assume their natural position? It is the opinion of many authorities that there are other causes at work to produce irregularities and Dr. Kingsley is specially quoted. The author himself has found in a great majority of such cases where he has obtained models of the mouth that, by measurement, there is room enough in the jaw to bring all the teeth into position without extracting the first permanent molar.

Again, extraction of any of these teeth causes a depression of the face and a loss of individual expression. In the regulation of teeth we have to consider what relation they bear to facial expression, and also the effect the shape of the arch has upon the human voice. When the former is narrow, cramped and pinched, the latter takes on a nasal tone. If the arch is widened the voice becomes rounder and fuller. Whether these teeth are extracted singly or all four at once, whatever time it is decided to extract them, it is rarely the case that any of the evils existing are remedied. The tipping or lopping of the crowns of the remaining molars has almost always occurred, occasioned by the loss of the bones and tissues, as the result of the extraction of the first permanent molars.

The Dental Review.

THE DENTAL PULP.

By M. Paolo Carreras, Pisa.

Pulpitis may be sub-acute, acute, or chronic. The first, sometimes called irritation of the pulp, easily occurs when there exists upon the crown of a tooth a superficial lesion produced by a chemical or mechanical cause, or by commencing caries, but it may also be noticed in teeth which do not show any lesion, and then principally by sudden changes of temperature. When the dental pulp is affected by subacute pulpitis there is a very marked degree of hyperæsthesia in this organ, to the sensations of heat and cold, to the contact of acid or sweet substances, and of a metallic or some other body. This hyperæsthesia is limited to Tomes' fibrils by which pain can be transmitted to the pulp, so much so that if, in a case of superficial lesion of the enamel, we cauterize the exposed surface of dentine, the exaggerated sensitiveness ceases.

It is thought that this is due to a slightly hyperæmic condition of the blood-vessels in the dental pulp in consequence of which the slightest irritating cause, momentarily increasing the flow of blood, gives rise to pain by the pressure which the said vessels, irritated by a larger quantity of blood, exert upon the nervous filaments.

It is difficult to prove this experimentally, for in the lower animals it is impossible by estimating symptoms exactly, to determine that a tooth is affected by subacute pulpitis, or that one has artificially produced it in a tooth ; whilst in the case of man, we are not justified in sacrificing a tooth affected with a simple subacute pulpitis. But considering what happens in acute pulpitis, as we see it, how the painful sensation is produced, that is, the stabbing pain, its suddenness, its cessation as soon as the irritating cause which produced it is removed, it may be said that the hyperæsthesia of Tomes' fibrils is due to a slight degree of hyperæmia of the pulp to which the painful sensation would be transmitted by the protoplasm of the said fibrils, without its being proved as already remarked, that the nerve filaments enter the dentinal tubes.

Acute pulpitis consists of an actual congestion of the blood vessels traversing the pulp, which, supplied with too much blood and being unable to dilate because of the absolute resistance offered by the walls of the pulp cavity, press strongly upon the pulp nerves and cause the lancinating pain characteristic of this complaint, a pain which increases when the patient assumes a horizontal position or becomes hot, in which case the increase of arterial pulsation becomes clearly marked.

Besides, if we prepare for microscopical examination the pulp of a tooth extracted in consequence of acute pulpitis, we shall find that the blood-vessels are actually turgid with a stasis probably caused by the circulation being impeded by the blocking of capillary veins brought about by the pressure of the inflamed pulp tissues, and that this inflammation extends to the whole organ. In some places white corpuscles are seen adhering to the vessel walls in large numbers, whilst in others they have escaped, and, along with the red corpuscles have penetrated into the connective tissue.

Il Progresso Dentistico.

SCIENTIFIC INSTRUCTION.

By Dr. A. H. Thompson.

It is apparent to all that we are entering upon a new era in dental education, and in the revolution that is upon us, the friends of pure science must be vigilant that its study is not molested by the iconoclastic wave of practicalism and the craze for mere money making that is sweeping over us. We must see to it that the position its importance warrants and demands, is maintained, and that it is given the attention it should have that students may receive the full benefits of science teaching in all its bearings. To that end one of the first conditions is that of methods of teaching. In this connection we notice that when the three years course becomes general, it will necessitate a graded course of study.

This method is scientific and will be productive of good results. It will check the rude haste and rush with which students try to get through college, and will lead to deeper learning by reason of greater leisure for study. In such a course the first year will be largely class-room work, and catechetical teaching will be its principal feature. This will be a sort of primary work and all will agree that new students are much in need of such a department. The main cause of the lowering of the standard under the recent college system, was that the teaching had to be brought down to a very low level to be rendered comprehensible to the minds of men unaccustomed to study. And the worst of it was that the standard had to be kept low to allow of completion of the course in a brief time. In the three years course this necessity will be obviated, for the student will have ample time to learn to study and to acquire knowledge also. The first year of class work and catechetical instruction will prepare him for study and perhaps lay the first layer of the foundation ; the next should be a combination of the class-room system and didactic lectures. By this time the student will have learned to study and can proceed rapidly in the acquisition of knowledge. The last year should be entirely didactic—with regular examinations, of course—as becoming advanced students and the dignity of the cultured gentleman whom we would then have before us. Simplification in the first year, precision in the second year and amplification in the third year, should be the keynote of the three years course. But will the colleges do this, or will they devote more time to the clinical department and make it the main thing ? With the tendency to practical teaching, there is danger of this, but it would be a great mistake to subordinate the fundamentals to the secondary branches.

Trans. Amer. Dental Association.

Reports of Societies.

MANCHESTER ODONTOLOGICAL SOCIETY.

The monthly meeting of the above Society was held at the Victoria Dental Hospital, Devonshire Street, All Saints, on Tuesday evening, November 1st, 1892; the President, (Mr. P. Headridge) in the chair.

ELECTION OF NEW MEMBERS.

The following gentlemen were duly elected members:—Mr. Richard Kloet, L.D.S.I., 10, St. Ann's Square, Manchester; Mr. Thos. E. Sherratt, L.D.S., Eng., Everton Road, Manchester; Mr. Thos. Wormald, L.D.S.I., Union Street, Oldham.

NOMINATION OF MEMBERS.

Applications for Membership were read from the following gentlemen:—Mr. Thos. E. Coysh, L.D.S. Eng., 27, Bentley Road, Liverpool; Mr. Frank Harrison, M.R.C.S., L.D.S., Eng., Glossop Road, Sheffield; Mr. Samuel McDowall, 428, Blackburn Road, Accrington.

CASUAL COMMUNICATIONS.

Mr. Renshaw exhibited a spittoon attached to a bracket, and having lateral and extension movements.

DEMONSTRATIONS

Mr. Peter Headridge restored, with a portion of an ordinary mineral tooth, the defective lower third of a right upper central incisor tooth; the pulp being alive. In this operation, the natural tooth was carefully ground down with a diamond disc revolving in the Dental Engine; this part of the operation completed, a suitable mineral tooth was selected, and ground down to accurately fit the natural tooth; holes were now drilled into the natural tooth on each side of the pulp to the depth of one-eighth of an inch, and a U-shaped piece of platinum wire fitted into the holes—the wire used being of a little less calibre than that used for the pins of mineral teeth. A groove was now cut into the mineral tooth with a diamond disc, corresponding to the U-shaped platinum wire, and this latter was fused into the mineral tooth by gum body, by the aid of a Parker's furnace, and when cemented into position by means of white cement, the operation was successfully and satisfactorily completed.

Mr. Dougan filled a mesial cavity in a right lower bicuspid with cohesive gold. A few small pieces of gold were packed in the retaining pits by hand pressure, and the rest of the filling was completed with strips of No. 5 cohesive foil, folded to No. 40, each strip measuring about a quarter long by one-sixteenth broad. The gold was consolidated throughout by using an electric mallet, made by himself from a pattern designed by Mr. Fred Masters, of Rusholme.

Mr. Simms demonstrated a method of rotating upper incisors, using enlarged plaster representations of teeth fitted with wax into cone-shaped metal holders.

Mr. Houghton showed the Brin Oxy-hydrogen Reflector. It was made use of by one of the demonstrators, and proved itself to be a most satisfactory illuminant.

Mr. Smithard exhibited and explained his improved gas apparatus, calling particular attention to the ease with which the gas could be liberated into the gas bag by means of the foot lever.

STUDENTS' SOCIETY, NATIONAL DENTAL HOSPITAL.

The usual monthly meeting was held on Friday, November 4th. The minutes of the previous meeting having been read by the Hon. Sec., Mr. C. Bascombe, and confirmed, Dr. Maughan, who was unanimously elected to the chair, in the absence of the President, Mr. Humby, gave the usual welcome to any visitors present.

Messrs. Fogg, Jenkin, Humby, Reeve, and Peacock, having been ballotted for, were declared by the chairman as having been (*nem. con.*) elected members of the Society.

CASUAL COMMUNICATIONS.

1.—Mr. Cutts brought forward a case of a well developed two rooted upper bicuspid tooth.

2.—Mr. Nicholls, in the absence of Mr. Beverley, showed a lower molar tooth, very deeply encrusted with tartar, which had been the means of producing two ulcers in the mouth of the patient, one as large as a shilling.

There being no more casual communications, Dr. Maughan called upon Mr. Rowe to read his paper on "Neuralgia, with a Dental Origin, and Modes of Treatment," which is published on page 1073.

Mr. Faro asked Mr. Rowe why, when mentioning exotosis, he advised tapping the lingual surface of the tooth rather than any other surface.

Mr. Nicholls said he was not quite clear as to Mr. Rowe's treatment of abscess, did he mean that a radical course was the one adopted in case of abscess? He wished also to mention the fact that he had known a case where an abscess had actually occurred in the molar region, and yet the tooth pulp was still quite sensitive. As regards medical treatment he had seen chloride of ammonium and butyl chloral hydrate, etc., advised.

Mr. Cutts said he should like to ask Mr. Nicholls whether he had actually seen the case of the abscessed tooth with living pulp.

Dr. Maughan said Mr. Rowe's paper was of a most interesting description, and of vital interest from a professional point of view. It was the duty of professional men to prevent pain in some way or other. Whether it was in a tooth, or the face, or stomach, whether it was due to indigestion, colic, etc., it was one of the chief aims in life to prevent pain. Speaking upon the subject of the irritation of the pulp and its consequent destruction, Dr. Maughan said, the lumen of the arteries became smaller, owing to the thickening of their walls, (obliterative arteritis), the axis cylinders of the pulp underwent obliteration, became decomposed; being denied nourishment, and squeezed up to nothing, the result was that the axis cylinder died.

With regard to the question as to how to treat pain, he suggested one eighth of a grain of morphia up to half grain doses, ammonium chloride, aconite ointment, (this produced numbness and tingling locally, but acted effectually). Iodides were very good, owing to the fact that the arteries were getting narrower, rest was good, over feeding, (milk, dark room, etc.,) galvanism, nitro-glycerine, cocaine hypodermically, gelsemium, etc. If neuralgia was referred to the front of the head on both sides, the stomach should be attended to, if to the top of the head, the blood was not healthy, if the back of the head, it was due to poor and frail health. Mr. Nicholls had referred to Croton Chloral hydrate, his (Dr. Maughan's) experience was a very lamentable one, the success of the drug being very feeble indeed.

Mr. STOCKEN asked Dr. Maughan how he (Dr. Maughan), with his theory of pathology of neuralgia, accounted for the intermittent pains of neuralgia?

Dr. Maughan having replied, he called upon Mr. Rowe to reply.

Mr. Rowe said he was glad his paper had been the means of such an interesting discussion, and thanked Dr. Maughan for the kind words he had spoken. He said as regards Mr. Nicholl's question as to abscessed teeth, he did not mean to imply that radical measures should be adopted, until all other means had failed. He again thanked the gentlemen present for their kindness in attending to his somewhat short and meagre paper, adding had he been intending to write a paper specially for the Society, he should have prepared a far more lengthy one, he should have no doubt corrected and supplemented many things; it was owing to there being no other paper brought before the Society, that he had been prevailed upon to read this one. It was a paper written from memory, and that alone would account for any errors, etc.

A vote of thanks to the chairman concluded the meeting.

STUDENTS' SOCIETY, VICTORIA DENTAL HOSPITAL, MANCHESTER.

The Inaugural Meeting was held on Tuesday, October 25th, at the new Hospital, Devonshire Street, Grosvenor Square. The proceedings took the form of a social meeting, to which members and friends were invited. About sixty persons were present. The large and fine Conservation room was utilized as a concert room, and refreshments, kindly provided by Mr. P. Linnell, were served in the waiting room.

The chair was taken at 7.30 by Mr. Linnell, President.

Mr. Lees read a letter from the Dean, Mr. Campion, regretting his inability, owing to indisposition, to attend the meeting.

The following gentlemen were proposed and seconded as members of the Society:—Messrs. F. Bellarby, G. Booth, W. Forsyth, P. Rhodes, and J. Wood.

Mr. Linnell then read the Presidential Address, which we publish on page .

The business being completed, Mr. Worsley opened the social part of the evening by an introduction on the piano, entitled "The Bells." During the evening several songs were given by Messrs. Molloy, Nicholson, Stephenson, and Smale, and recitations by Messrs. Dreschfield, North, and Molloy. The company were also favoured with several comic songs and humorous sketches by Mr. Hugh Montgomery. Mr. Bostock gave a display of lantern slides, taking his hearers on a tour through the Lake district, Isle of Man, North and South Wales and Derbyshire.

At the close of the meeting, Mr. W. Headridge proposed a vote of thanks to Mr. P. A. Linnell for his hospitality. Mr. P. A. Linnell in reply said that he thanked all present for the kind way in which they had welcomed him, and referred especially to the good wishes of the Students of the Hospital.

Mr. D. Headridge proposed the toast of visitors to which Mr. North suitably replied.

Mr. H. Dreschfield proposed a vote of thanks to the Hon. Secretaries for the thorough way in which they had arranged such a successful evening's entertainment,to which Mr. Bostock briefly replied.

Dental News.

THE DENTAL HOSPITAL OF LONDON.

Gentlemen either now or formerly connected with the Hospital or Medical School, who may, through inadvertence, not have received special notice of the Annual Dinner on the 3rd, and who desire to be present, are requested to communicate with the Dean, at the Dental Hospital, 40, Leicester Square.

ROYAL COLLEGE OF SURGEONS IN IRELAND, DENTAL EXAMINATION.

The following gentlemen having passed the necessary examination, have been admitted Licentiates in Dental Surgery of the College :—Mr. Ernest Catt, (Scarborough), and Mr. Louis Benjamin Eskell, (Bath).

NATIONAL DENTAL HOSPITAL AND COLLEGE.

The Annual Dinner of the past and present Students was held at the Holborn Restaurant on Friday, the 25th ult., Sir James Crichton Browne, M.D., F.R.S., presided, and there was a large attendance. Amongst the guests were Messrs. Chas. S. Tomes, Morton Smale, J. H. Mummery, F. Canton, S. J. Hutchinson, J. S. Turner, and the Deans of several of the Medical Schools.

After the Toast of "The Queen," the Chairman called upon the Dean (Mr. Harry Rose) to read a Report. This referred especially to the New Hospital and College Buildings now in course of erection, and which it is expected will be in occupation this time next year. At present, the whole of the chairs are being utilised by students, and the records for the past year show that patient present themselves in ever increasing numbers. As, when the Dentists' Act was passed, it did not seem right for a public Charitable Institution to withhold the acquisition of knowledge from those who sought it in a legitimate manner, registered practitioners were permitted to take out short terms of hospital practice. That privilege is now limited, and, under the altered circumstances of the present day, will probably in the future be found unadvisable, except in the case of Army and Navy Surgeons.

Sir J. Crichton Browne then distributed the following Prizes and Certificates for the Session 1891-92.

Rymer Gold Medal—Mr. F. M. Farmer.
Dental Anatomy ; Medal—Mr. R. E. Nicholls,
,, Certificate—Mr. E. C. D. Bascombe.
Dental Surgery ; Medals—Messrs. R. E. Nicholls, and
,, J. S. McFarlane.
,, Certificates—Messrs. F. M. Farmer,
,, and R. W. Ward.
Dental Mechanics ; Medal—Mr. J. S. McFarlane.
,, Certificates—Messrs. E. C. D. Bascombe, and F. M. Farmer.
Materia Medica ; Medal—Mr. F. M. Farmer.
,, Certificate—Mr. J. S. McFarlane.
Histology ; Certificates—Messrs. Beverley, and
,, Kelsey.
Metallurgy ; Medal—Mr. R. E. Nicholls.
,, Certificate—Mr. Reece.
Students' Society Prize—Mr. R. E. Bascombe.

Entrance Exhibition, value £15.—Mr. Norman Reeve.

Ash Prize—Mr. H. B. Rowe.

In proposing "Prosperity to the National Dental Hospital and College" the Chairman said he preferred to strike a chord of sympathy instead of attempting to discourse upon technical subjects, especially as that chord was ready to respond. Such a dinner of Past and Present Students was a meeting of those who came to enjoy the pleasures of memory, and for others that of hope. Having described his visits to the present hospital, and the new one now building, he referred to the common bond of anatomical and physiological knowledge between the Medical and Dental professions, and in discussing the Dentists' Register he strongly expressed the opinion that as there should be no taxation without representation, there should be a dentist upon the General Medical Council. He should also have a medical qualification, but they would have no difficulty in finding a suitable man. Alluding to the great benefits the medical profession had conferred upon humanity by the study and application of Preventive Medicine, Sir James urged that the continuance of analogous efforts on the part of dental practitioners was much to be desired.

Mr. E. W. ROUGHTON, and THE DEAN, responded to the toast

Mr. J. SMITH TURNER in a sympathetic speech proposed the "Past and Present Students," and referred in feeling terms to the death of Mr. Felix Weiss.

Mr. MORGAN HUGHES and Mr. CECIL BASCOMBE suitably responded.

Mr. SPOKES proposed "the Visitors," to which Mr. HOWARD MUMMERY, President of the Odontological Society, and Mr. S. J. HUTCHINSON, Dental Surgeon to University College Hospital, replied.

Dr. CUNNINGHAM, in proposing "The Chairman," said that the address on "Tooth Culture" which the Chairman had delivered at Cambridge had spread far and wide, to a larger audience than he had then spoken to, and had done much to help Preventive Dentistry. Criticisms had been passed on such efforts, suggesting that it was a begging for the employment of their professional services, but without intelligence upon the part of the public it was difficult to do good work.

Sir J. CRICHTON BROWNE genially replied, and said that he hoped, if not in the same capacity, to attend again on a similar occasion.

Songs were contributed during the evening by Messrs.

Alfred Smith, D. Hepburn, W. Rushton, and others. There were also violin solos by Mr. John Pitts, and recitations by Mr. Ernest Genet. The proceedings were continued until a late hour.

APPOINTMENT.

W. H. Dolamore, M.R.C.S., M.R.C.P., and L.D.S. Eng., appointed second Dental Surgeon at the Westminster Hospital.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the " British Journal of Dental Science."

OXYCHLOROFORM ANÆSTHESIA.

Sir,—I send you a short account of a new idea, which may interest your readers. Pure oxygen gas and chloroform, inhaled through an oxy-chloroform inhaler, is the latest notion in anæsthetics. It is claimed that, by its use, *overdosing* and consequent paralysis of the Vagus is prevented. First, because less chloroform is taken ; secondly, because regularity of the respiration and perfect aëration of the blood is ensured and maintained *throughout* administration ; thirdly, because spasm of the pulmonary and systemic arterioles cannot occur, thus superseding Nitrite of Amyl and artificial respiration. Lastly, there is an absence of the usual post-anæsthesial depression, and a much more rapid recovery of the patient.

I am, Yours truly,
T. G. H. NICHOLSON.

Liverpool, Nov. 15, 1892.

ANSWERS TO CORRESPONDENTS.

A.J.F.—The particulars sent are not sufficiently explicit to allow of a definite expression of opinion. We believe that any person may keep a " drug " store, provided he does not sell poisons, but whether the presence of his name upon the Dentists' Register would allow him to evade the Pharmacy Act, and " retail " poisons as a matter of routine, is another matter. Although not of much interest to the ordinary dental practitioner, we shall watch for the result, as in the event of an adverse verdict, the recent judgment with regard to accumulation of penalties may perhaps be quoted.

A Dental Student has omitted to enclose his name and address.

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ON SOME MECHANICAL DEVICES FOR THE RETENTION OF ARTIFICIAL DENTURES.*

By STORER BENNETT, F.R.C.S. Eng., L.R.C.P. Lond., L.D.S. Eng.

Mr. President and Gentlemen,—Having been engaged for ome time in an endeavour to improve the method of constructing bands by which artificial plates are steadied and held in position, I beg to lay before you the results of some experiments aimed at the production of hinged bands, whereby teeth may be clasped around their most constricted portions, unimpeded, nay even assisted by, the overhanging and expanded portions of their crowns.

From this variation in construction we are enabled to ensure more accurately fitting plates, and in many instances, to effect a material reduction in their size. These bands are of two varieties, the first being self-adjusting, and is designed on the principle of the spring rings frequently attached to watch chains, while the other is a modification of the ordinary brooch joint.

The self-adjusting band is made by taking a piece of thin gold tube, about 3-8ths of an inch long, the width exactly corresponding to No. 14 standard iron wire gauge. One end of the tube is made solid for about 1-16th of an inch by soldering into it a piece of gold wire, while the inside of the opposite extremity is tapped with a screw for 1-32th of an inch. A slot is sawn through the middle of the solid extremity parallel to its long axis, and carried as far back as the hollow part, or tube, and rather farther on one side than the other. Into the slot a flat piece of gold is fitted, to form the tongue, or middle portion of a hinge, the width of the tube, but projecting slightly beyond its anterior extremity ; the opposite extremity of the tongue reaching as far back as the short side of the slot. A hole is next drilled through the solid part of the tube and the tongue, at right angles to the slot, and a pin is passed through them and ultimately riveted or screwed. A band having been accurately fitted to the model, is soldered to the anterior extremity of the tongue, and when this is replaced in the slot and transfixed by the pin the whole forms a hinged band. A piece of extended spiral spring is now thrust into the open end of the tube until it presses against the tongue, and is then held in position by a small gold plug screwed into the tube behind it. It will greatly facilitate rapid and accurate cutting of the slot if a piece of steel tube with a slot in one end, called a template, is used as a guide ; and if a hole is drilled in the template across the slot it ensures the hole in the gold tube being properly placed.

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*A Paper read before the Odontological Society of Great Britain.

The band so formed may be attached to a gold plate, by removing the spring and soldering the tube in the most suitable position, the spring being subsequently replaced and retained by the screw plug. Where vulcanite is used it is necessary, before packing, to fill in the slot with a little osteo, to prevent the ingress of rubber, the osteo being subsequently dissolved away with hydrochloric acid.

Such a band will automatically open and close as it reaches the expanded or contracted portions of a tooth, when it is necessary either to insert or remove the plate, and will be found most useful in the very class of cases in which an ordinary band fails. While the spring effectually retains the band in contact with the constricted portion of the tooth, it readily allows it to be opened, and thus avoids the friction and resulting pain that so frequently accompany the use of tight bands.

In some cases it is useful to employ a band which can be opened, and will remain fixed in this position while the plate is being inserted or removed from the mouth ; the band then being closed and remaining immovably fixed until it is intentionally opened again.

In this case the band is soldered to the piece of tube which forms the central portion of a brooch joint, the band being carried sufficiently beyond the tube to press on a small flat spring, bent into the shape of a horseshoe magnet. This causes the joint to open or close with a snap, the spring locking the band securely in either position.

In order to prevent the ingress of rubber during packing, or of food when in use, the joint and spring are enclosed in a small gold box—which measures only 3-16ths of an inch in its largest diameter—which can be soldered to a plate or embedded in vulcanite.

Cases sometimes present themselves in which but one or two teeth—say a second bicuspid and first molar—have been lost on one side of the mouth only, the resulting space being wedge-shaped, with the base towards the gum, from the tilting of the adjoining teeth. The difficulty of treating such cases is obvious, for either the plate is too large to pass between the approximated crowns, or when in position is very loose, from the gaps which must exist between the plate and the necks of the natural teeth.

Such cases are usually treated—if treated at all—by inserting a plate which covers a large portion of the mouth, in order to insure due steadiness and safety. So large a plate is a source of such inconvenience to the wearer, that in many instances its use is abandoned, and the patient is, therefore, frequently dissuaded from having such a gap filled up at all.

Now I think it will be admitted that the smaller we can make our plates—having due regard to their safety, steadiness, and ease of insertion and removal—the better. The patient will experience much greater comfort, and less damage can be done to teeth in remote portions of the mouth.

If we make use of the locking bands just described, the treatment of such cases becomes easy. A plate no larger than the space, but which it accurately fits, has ordinary bands adjusted to the lingual surface of the tooth in front and behind the gap. Two locking bands are then adapted to the labial surfaces of these teeth in such a way that, when open, they are no wider than the width of the gap. Such a plate, when placed in the mouth with the bands open, may be dovetailed into position by pushing it outwards from the lingual towards the buccal surface, and is secured by closing the bands, the overhanging crowns effectually preventing any upward displacement.

Instead of a back tooth, a front one may be lost, leaving the same wedge-shaped space with the wedge towards the gum, and needing the same large-sized plate to carry the artificial substitute. This may, however, be obviated in the following manner :—The back of a flat tooth is connected to a very small plate by a hinge, extending from one side of the gap to the other. By this means the tooth may be turned out of the way while the plate is pushed into position, by being drawn forward by its cervical extremity until it has assumed a horizontal direction. By closing the hinge the tooth becomes vertical, and is securely locked into position.

For such a purpose a small piece of plate is accurately fitted to the gap, and a band adjusted to the lingual surface of the tooth on either side. A thin, flat tooth, having the pins as near the cervix as possible, is backed and fitted in the usual manner, a small band, however, being soldered to each side of the backing, so as to fit the buccal surface of the necks of the adjoining teeth.

A piece of 12-carat gold, the width of the space, has two parallel cuts made in it with a pair of shears, extending through about three-quarters of its length, converting it into a figure somewhat resembling a comb with three equal teeth. The back of the comb is soldered to the plate so that the comb lies exactly behind the backing of the mineral tooth. A piece of thin gold tube is next soldered to the top of the two outer teeth of the comb, and cut away from the central one. This central piece of tube is soldered to the backing of the tooth, so that when a pin is thrust through the tubes, the tooth is connected to the plate by a brooch joint. If at the same time a little tongue of gold is soldered to the central tube so as to press on the middle portion of the comb, this, being a spring, will press on and retain the artificial tooth, either in a horizontal or vertical position.

When these small buccal bands are too conspicuous, from the necks of the teeth being frequently displayed, an artificial tooth may be retained in the dovetailed space by small blades pressed against the approximal surfaces of the adjoining teeth, by means of a spiral spring.

A small plate, the size of the gap, is struck up, and its sides reduced until it will just pass through the narrowest part of the space between the neighbouring teeth. A flat tooth is backed and fitted in the usual manner. Two thin blades are then fitted to the necks of the approximal surfaces of the adjoining teeth, and one is soldered to the plate. A small piece of square gold tube is next soldered, so that it lies transversely across the gap, immediately behind the backing of the tooth, and closed at one end by being in contact with the blade. A piece of square wire, which fits the tube, but not so long as it, is next soldered by one end to the other blade, so that when all are in position, the wire will lie inside the tube. A slot is next cut in the upper surface of the tube, parallel to its long axis, but not extending as far as either end, and a small hole is drilled and tapped in the wire, so that a screw may pass through the slot and retain the pin wire in the tube, at the same time allowing it to travel inwards and outwards for a short distance.

If a fine extended spiral spring is thrust into the tube in front of the wire, and the latter is screwed into position, the spring will tend to push the wire and blade outwards against the adjoining tooth, and so retain the artificial one in position.

An objection will at once suggest itself that the lateral pressure on the natural teeth will tend to loosen and displace them ; though this seems probable, the spring employed is so weak, that such an unfortunate result has not hitherto occurred.

At one time, I hoped that the alloy, known as nickel-steel, would prove of value to us, from its elasticity and non-liability to rust. So much difficulty, however, is experienced in combining such a quantity of nickel with the steel as will prevent oxidation, and yet not impair the elasticity of the steel, that up to the present its use has proved impracticable for our purposes. Gold has, therefore, been the material employed, in the construction of the springs previously described, the alloys found most useful being :—

		Dwts.	Grs.
For spiral springs 15 carat ...	F.G.	12	12
	F.S.	2	12
	F.C.	5	0
	Oz. troy	20	0

For all the other springs 12 carat, pale

	Dwts.
F.G.	10
F.S.	6
F.C.	4
Oz. troy	20

While the original patterns of the foregoing devices were in each case constructed in my own workroom, I have found it more convenient to have the subsequent ones made by a jeweller, Mr. Baker, of 55, Great Marlborough Street, W., from whom they may be obtained.

PLASTER IMPRESSIONS.

By Philip Betts, D.D.S.

Mr. President and Gentlemen.—The few suggestions I shall offer you to-night can scarcely lay claim to the dignity of a paper, for I shall simply endeavour to make plain in as few words as possible the steps usually taken by myself to obtain an impression of the mouth in plaster of Paris. I will also, practically demonstrate my method with the help of one of our members. First of all I obtain an impression of the case in hand in either way or any of the compositions usually employed. Then cast the model, and dry and boil in wax as usual. When cool, this model is employed to shape in "Godiva" or "Stent," an impression tray for taking the final working impression in plaster of Paris. Wax may be mounted on the first model so that the bite may be taken and

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* Read at the Manchester Odontological Society.

the teeth selected at the same sitting as when the final impression is taken. The composition impression tray having been prepared and tried in the mouth to prove its suitability to the case, two wine-glasses and a spoon will be required ; one glass containing about two-thirds its complement of slightly warm water, plus as much common salt as would cover a sixpence, and the other containing the required amount of plaster of Paris. When all is ready, the glass containing the plaster of Paris should be emptied into the one containing the salt and water, when the excess water may be poured off into the empty glass. The plaster batter having been gently stirred up may be placed in the tray, and the whole then steadily pressed into its place in the mouth and held there until the plaster is hard enough to break with a clean fracture. I can scarcely indicate the precise moment at which either to introduce or withdraw the plaster, but a few trials will afford the necessary experience. The impression having been withdrawn from the mouth, and all fragments of plaster having been collected therefrom, those pieces which are required should be returned to their places on the impression tray and waxed in position. The impression is now to receive three or four coats of a thin alcoholic solution of shellac, care being taken that the one coat is dry before the next is added. When the last coat of shellac is quite dry, the impression should be brushed over with a film of oil, placed in water until quite saturated, and then cast in the usual way. Sufficient time having been allowed for the plaster to become quite hard the model should be placed in hot water and the composition tray removed, when the plaster impression may be readily raised with the point of a knife from the face of the model. Should any part of the impression be inclined to stick to any part of the model, it may be loosened by holding the face of the model against the flame of a Bunsen burner for a few seconds Should any part of the impression be particularly thick, it will be well to scrape it away until the shade of the shellac is visible before attempting its removal, otherwise some prominent part of the model may come away with it. As regards the plaster to be used, I have been at some trouble to find that most suitable for the purpose; that is, tolerably quick setting and easily fractured when set. I now take the ordinary workshop plaster and pass it through a fine hair sieve to remove the coarser particles. I also find that no two lots of plaster behave quite the same, so I would recommend a few trials of each new lot before actual use. The water used for mixing the plaster should be slightly warm, for this condition serves two purposes; it causes the plaster to set quicker, and prevents the painful shock to sensitive teeth which would be produced by any cold application.

WEISSMANN'S THEORY OF HEREDITY.

Weissmann assumes that every living cell contains two kinds of living substance, namely, the nuclear plasma and the nutritive plasma. The former is believed to possess germinative, directing, and hereditary functions, while the latter is thought to be concerned with the assimilation of food and the more purely physical functions. The functions assigned to the nutritive plasma are believed to be carried out under the direction, as it were, of the nuclear plasma. Furthermore, Weissman holds that the nuclear plasma consists of two substances——a germinal plasma (which is the primitive form, and which alone is endowed with heredity), and a histogenetic plasma (which has been derived from the germinal plasma, and which controls the division, growth, and differentiation of the cell). Fertilization consists in the bringing to the ovum a certain amount of germinal plasma from a different individual· Weissman assumes that, prior to fertilization and development, the ovum must cast away its old histogenetic plasma and an amount of its germinal plasma equal in quantity to that brought to it by the spermatozoon, and that it effects this in extruding (1) one histogenetic polar globule, (2) and one germinal globule. On this view the germinal plasma is never wholly eliminated from the ovum, so that it may be regarded as transmitting all the accumulated ancestral characters which have been derived from the vast number of its forbears.

Those interested in such matters should read the volume on Embryology in Quain's Anatomy, from which the above statement is derived.

REFINING DENTAL ALLOY.

H. N. Warren describes a quick method for refining dental alloy, *i.e.*, silver alloyed with from 25 to 30 per cent. of platinum. The latter metal will dissolve in nitric acid when sufficient silver is present, but, in the present instance only some 10 per cent. of the platinum passes into solution after long boiling. The whole of the silver in the alloy is of course dissolved at the same time, and, on introducing a bar of copper into the solution, both the silver and platinum are quickly replaced. A further addition of nitric acid now redissolves the silver, leaving the platinum untouched. On dissolving the latter, together with the other 15 to 20 per cent of the same metal left at first, in *aqua regia*, precipitating by an excess of ammonium chloride, evaporating to dryness and igniting, pure platinum remains. The silver is recovered in the usual way by precipitation as chloride; but this method would be useless before removal of the platinum, since nearly a fourth of the amount present would be carried down with the silver chloride·

Chem. News.

British Journal of Dental Science

LONDON, DEC. 15th, 1892.

A RETROSPECT.

The recollection that this present number of the JOURNAL completes our thirty-fifth volume naturally leads to an inclination to look back upon one or two of the more important dental events which have happened during the past year, and which constitute factors in the continuous progress which all those who have at heart the true interests of the profession are glad to recall.

From the more strictly scientific side, perhaps the most noticeable feature has been in connection with the new observations upon the structure and development of Dentine. Any well-authenticated facts in relation to a tissue with which dental practitioners are so constantly dealing, must prove of advantage. Mr. Howard Mummery in the commencement of the year wisely departed from the usual course and turned the President's address to the Odontological Society to good account, summarising our knowledge upon the subject of Dentine, and giving a clear exposition of his own views, based upon the facts which he had communicated to the Royal Society. In consequence of this investigation it is probable that the tissue in question will now be regarded as being still more closely associated in structure with ordinary bone, rather than as presenting a peculiarly specialised development. The same observer has also done good work in connection with the ennervation of teeth, and corroborative evidence is apparently forthcoming from the Continent which will possibly make it easier to regard the dentinal fibril as analogous to the contents of the canaliculi of bone.

Amongst disputed points in practice, much interest seems to have been taken in the advantage, or otherwise, likely to arise from the removal of the first permanent molar in certain conditions of the dental arches. The matter was fully discussed at the Annual meeting of the Dental Association at Manchester, but judging from articles in the various Journals, abstracts from which we have taken care to present to our readers, there still remains a considerable divergence of opinion. There is not only the question as to whether the particular tooth mentioned is the one which should be removed in certain well recognised conditions, but the further, and very important, point as to symmetrical extraction which involves the loss of the corresponding tooth in the opposite jaw, or even those on the other side of the mouth. There appears an evident tendency on the part of some practitioners to regard the perfect articulation not only of teeth, but even of cusps, as an important physiological factor, much overlooked, in securing the best denture for the patient.

In regard to the more political aspect, there cannot be much doubt but that a distinct advance may be claimed towards a suitable recognition at the hands of the public, and in the estimation of other Professions. In spite of the lucubrations of the ever-present body of mal-contents, and the despondency of pessimists, there is, in our opinion, much ground for congratulation. The judgment delivered, in the Court of Appeal, by the Master of the Rolls and two Lords Justices, may be taken to show that the General Medical Council, so long as they act without *mala fides*, have extensive powers well recognised by the highest legal authorities. We have so recently called attention to the latest action on the part of the Council, that as an additional evidence of an intention to promote dental interest, we content ourselves with directing our readers to the remarks made by the President, Sir Richard Quain, when occupying the Chair at the annual dinner of the Dental Hospital of London. Medical men, too, will not be slow in their appreciation of the fact that the Council intend to assist dentists to secure and maintain the same professional footing as the general practitioner.

The decision of the Naval Authorities as to the need for proper dental treatment of the men under their control, and the acquiesence of the Local Government Board in sanctioning appointments of dental surgeons by Boards of Guardians, may also be quoted as elements not to be overlooked in reviewing results creditable to the year now drawing to a close. Whilst our professional literature has, we think, fairly met and supplied the usual demand, the educational work in dental Schools throughout the country has also shown continued activity; and increasing competition has tended to prevent a mere "marking time."

But it is not only close at home that there is ground for laudation. Our brethren at the Cape and the Antipodes have not been behind-hand, and as we hold that there should be no geographical limit or distinction known amongst honourable practitioners doing good work, we cordially extend to our subscribers in distant lands the share of our congratulations which their efforts deserve.

THE NEW MEDICAL ACT IN FRANCE.—The new act, regulating the practice of Medicine and Dental Surgery, will shortly be promulgated officially, and its provisions will come into force a year later. No one will be allowed to engage in the practice of Medicine in France, who does not possess a diploma of Doctor of Medicine conferred by the French Government. Hitherto dentists were not subjected to any regular course of studies, nor required to pass any examination. The new act provides for the establishment of a diploma of Dental Surgeon, and no one will be allowed to practise as a dentist unless he has that Diploma, or is a Doctor of Medicine. Special conditions of curriculum and examination must be complied with before the Diploma is granted.

TECHNICAL EDUCATION.—At a recent distribution of prizes to students of Science and Art, Professor Rücker, F.R.S. in an admirable address, alluded to the great advances made, within the last twenty years, in this country, in connection with technical education. Whilst, however, paying this tribute he felt bound to say that much yet required to be done if we were to keep pace with our friendly competitors amongst the Continental nations. He gave some account of the palatial laboratories which he had visited in the course of an official inspecton he had been commisioned to carry on abroad. These splendid arrangements were made not merely to exalt Science, nor " to pamper the pride of Professors", but were necessary in order that the work could be successfully pursued in detail, with plenty of space. The Professor is an able speaker, and the applause with which his patriotic remarks were met with was, we hope, a happy augury for a successful issue whenever he has the opportunity of addressing those in authority.

FOREIGN BODIES IN THE LUNGS.—It is well recognised that it is possible for the root of a tooth to pass accidentally down the larynx, the patient going away without the manifestation of any marked symptoms. Two cases have just been recorded in the *British Medical Journal* in which a different kind of foreign body entered the lung, and the sequel in each illustrates the difficulty of diagnosis where the initial cause has been unsuspected or forgotten. In the first, a man was thrown from a trap whilst smoking a pipe, the vulcanite stem of which was found to be broken. There was a sharp hemorrhage, presumably from the lungs, and though the patient was afterwards able to resume his duties he complained of pain in the front of the chest, and thought he must have been bruised there. He also had a spasmodic cough as if something was tickling his throat. His case was diagnosed as gouty bronchitis, but about nine months after the accident he coughed up a piece of pipe-stem broken at the time of the accident. The second patient, whilst taking mutton broth, felt something "go the wrong way," which caused some choky cough, but the incident passed without much attention. Later, a patch of dulness, followed by moist sounds and hæmoptysis, led to a fear of tuberculous mischief; but the appearance of a piece of mutton bone one day, in the expectoration, cleared up the case. The foreign body was in the lung for a year.

Death from Chloroform.—The Cape newspapers contain accounts of the death, whilst under chloroform, of a young lady who had four teeth extracted. The evidence of the administrator showed that two and a half drachms were used in a Junker's inhaler, and that anæsthesia was induced in about 15 minutes. After the teeth were removed the patient half sat up and put her hand to her mouth, but was laid back again whilst the dentist examined another tooth with the mirror. It was then noticed that respiration had ceased, and in spite of all efforts, including eversion, injections of ether, and galvanism, the patient did not recover. Our information being derived from newspaper reports only, we do not criticise the case, but assuming the evidence to be correctly given, there are one or two points of interest. It was stated that when natural respiration ceased no chloroform had been given for from ten minutes to a quarter of an hour. Further, the administrator was of opinion that the heart continued to beat for an hour afterwards, although he admitted that he might have been mistaken on this point, when present at the post-mortem examination made by the District Surgeon. It was then agreed that there was fatty degeneration of the heart, besides some aortic incompetency, two of the aortic valves showing pin-point perforations, and it was concluded that the cause of death was syncope

LOCAL TREATMENT OF EPITAXIS.—In places where the bleeding is associated with erosion of the anterior part of the nasal septum, Dr. P. Houdeville recommends the use of silver nitrate to the spot. If the hæmorrhage is going on at the time, pressure must be applied on the anterior part of the septum by an assistant or the patient. Small pieces of cotton wool are tied to probes, and one is dipped into a 20 per cent. solution of cocaine. A bead of silver nitrate is melted on a flat probe, and the patient told to blow his nose. The speculum is then rapidly introduced, the bleeding spot wiped, and cocaine applied. This causes some vascular contraction, so that the bleeding spot can be seen, and the caustic is kept upon it until an eschar is formed. It is stated that the patient can then blow his nose, even violently, without return of the hæmorrhage.

AN UNSCIENTIFIC PRESS.—Mr. Ernest Hart in replying for "The Press," at the Bristol Medical School dinner, confessed that in two respects there was room for improvement in the English Press. It was wholly unscientific and, with few exceptions, ignorant of, and generally adverse to, biological scientific interests. It follows readily in the train of the worst charlatans and impostors in medical science. The other point alluded to was the habitual offence of the sale of advertisement columns to the quack. No other press in Europe, in Mr. Hart's opinion, admits such advertisements as are common in nearly all our papers, and especially in the religious ones. He thought it a stain upon the fair fame of the British press. "A shameful blot on the fair fame of journalism" were the words used by the writer of a paper dealing with much the same question, earlier in the year, and we shall watch, with interest, whether Mr. Hart's criticism gets reflected in the mirror which a certain Female Form holds up to Nature.

THE WARNING TO DENTISTS.—Our contemporary, *The Chemist and Druggist*, apparently feels called upon to watch over the interests of those Chemists whose names appear in the Dentists' Register. It therefore without delay proceeded to inform any such that if they received the notice which the General Medical Council recently decided to issue with regard to "covering," they need not feel alarmed. With this we quite agree provided they pay attention to the caution. But our contemporary differs from us in asserting that if the Council's resolution be carried out to its logical conclusion dental apprenticeship will become impossible. The apprenticeship consists in three years teaching in dental mechanics, and apparently the *Chemist and Druggist* has the dental hospital student in mind when recording its opinion that the Council do not mean to enforce their threat to such an extent, and so prevent students fulfilling the surgical part of their curriculum. The Council may "probably think two or three times" before taking action "of the kind hinted at," but the Courts have already refused to interfere with the discretion of the General Medical Council, and it is certain that the latter has more power than some chemists appear willing to allow. The warning issued to dentists is on all fours with that issued to medical practitioners in 1883, and, where necessary, will be followed by the same results. We are not anxious to believe that there are many chemists carrying on branch dental practices by means of unqualified men. It is another class altogether to whom the warning will be unwelcome; men who whilst wishing to enjoy the use of the title "dentist" regard it principally from a purely commercial aspect.

Reports of Societies.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

Ordinary monthly meeting, November 7th, 1892, Mr. J. H. Mummery, M.R.C.S., L.D.S., President, in the chair.

The President, on taking the chair, said he desired to address a few words of welcome to the members at the commencement of a fresh session. He said it was his painful duty to record the loss by death of three members since their last meeting, viz., Mr. Charles Vasey, an original member, who had held the posts of President, Librarian, and Secretary, and was elected an honorary member in 1888 on his retirement from practice; his geniality and kindness had won the esteem of all who knew him, and the President was sure that they would all hear with great regret of his loss. Mr. Richard White, of Norwich, had also gone over to the majority; he, too, was an original member, and constituted a link with the past. He retired from the membership of the Society five or six years ago, but the Council, considering his long connection with them, had decided, with the approval of the Members, to send a vote of condolence to his family. They had also lost Mr. Edmund Kelly, who joined the Society in 1876.

Mr. JOSIAH MANSBRIDGE, M.R.C.S., L.R.C.P., L.D.S., of 112, Harley Street, was at the April meeting of the Society balloted for and duly elected a Resident Member of the Society.

The Minutes of the previous meeting having been read and confirmed,

Messrs. A. R. Colyer, P. Edgelow, J. Mansbridge, W. Rushton, and T. H. G. Wrighton, having signed the Obligation Book, were formally admitted Members by the President.

The PRESIDENT announced that he had also received duly signed obligation forms from the following Non-resident Members:—Mr. W. D. Moon, of Newcastle; Mr. J. Amoore, of Edinburgh; and Mr. P. B. Reading, of Sydney, Australia; and he declared them admitted as Non-resident Members of the Society.

Mr. H. W. STONER, L.D.S. Eng., of Tylney House, 110, Queen's Road, Brighton, was nominated for Non-resident membership.

The Secretary, in the absence of the Librarian, Mr. Ashley Gibbings, read the Librarian's Report, which stated that since the last meeting the following books had been presented by the authors:—"Address to the Students of University College," by S. J. Hutchinson; "Notes on Dental Practice," by Henry C. Quinby (two copies); and "Note Book for Dental Students: Dental Anatomy and Physiology," by J. F. Rymer. The following books had been added to the Library by purchase:—"Odontalgia," by S. Parsons Shaw; "Dentition as Indicative of the Age of the Animals of the Farm," by Prof. G. T. Brown; and "Elements of the Anatomy and Diseases of the Teeth," by H. T. Kempton, F.L.S. They had also received *The Transactions of the Royal Dublin Society*, and the *Proceedings of the Royal Society*.

The Curator (Mr. Storer Bennett), in reply to the President, said that he had no report to present.

The President called upon Mr. E. Lloyd Williams for a Casual Communication.

Mr. E. Lloyd Williams said that he did not propose to occupy the time of the Society for more than two minutes, while he brought to their notice a case of a supernumerary tooth in an infant aged two years. The case had occurred in the out-patient department of the Westminster Hospital a week previously. The tooth was cut at 13 months, and a model was taken when the child was 2 years and one day old. The condition he believed to be rather rare, and was, in fact, the only one that he himself had seen of the kind. The tooth itself was rather interesting from the fact that at first sight it appeared to be a supplemental central incisor, but on examination it proved to be a supernumerary tooth with a conical cusp on its lingual aspect. He had much pleasure in presenting the model and tooth to the Museum, which was not very rich in cases of this sort.

The President thought the case interesting, and the Museum would be very glad to have it. He should be glad to hear the comments of members upon it.

Mr. David Hepburn remarked that he had had an opportunity of examining Mr. Lloyd Williams' model, and it seemed a similar case to one sent to him by Mr. J. F. Corbett, who at that time was resident in Dublin. This case he showed to the Society about twelve years ago. He had the tooth by him now; perhaps Mr. Corbett, who was present, would be able to give them some more information about it.

Mr. J. F. Corbett regretted to say that he did not take a model of the child's mouth. There were two supernumerary teeth; the child had all the temporary teeth standing, and these two were behind the two lower centrals.

Mr. Ackery mentioned that he had reported a case about ten years ago, in which there were two supernumeraries for supplemental temporary teeth in the lower jaw; they were right inside the arch, posterior to the lateral and canine on either side. The interesting feature of the case was that he was able to show the patient after an interval of six or seven years, when the permanent teeth were erupted. There were then four normal incisors, two supernumeraries, and two persistent temporary teeth. The models of the case in both its phases were in the Society's Museum.

Mr. M. Hopson some three years ago had a case of a supernumerary in the upper jaw removed from the mouth of a child aged 6; it geminated with the left central. He had the specimen and should be pleased to present it to the Society.

Mr. Henri Weiss exhibited a mouth mirror constructed from designs of his own by Messrs. Ash and Sons. He pointed out that the object of the contrivance was to obtain a view of the upper teeth, particularly the incisors, at the same time leaving both hands free, by having the mirror attached to the lower teeth. Many similar mirrors had from time to time been introduced by the profession, but he claimed for this one a wider field of vision, and a satisfactory and simple means of attachment. It consisted of two parts, the mirror with ball and socket movement, and a clamp. The mirror and clamp could be detached, so that mirrors and clamps of various designs could be interchanged to serve the special requirements of the case. By leaving both hands free the preparation and filling of distal cavities became a very easy matter. He apologised for not having one mounted on a mannikin to illustrate its use, but desiring to bring it before the Society as an original communication, and Messrs. Ash having only that day delivered these copies, he was unable to do so.

The President remarked upon the extremely interesting and ingenious character of Mr. Weiss' contrivance, and subsequently called upon Mr. Storer Bennett for his paper, which is published on page 1105.

Discussion.

The President said that the paper to which they had listened was a very interesting and valuable one; they had always thought hitherto that hinged teeth were peculiar to fishes. Mr. Storer Bennett had shown a large amount of ingenuity in the contrivance of the band; it seemed to him that the lower denture got over a serious difficulty in an effectual manner.

Mr. Henri Weiss said that Mr. Storer Bennett had dealt with the subject in such a thorough and lucid manner, and had explained his processes so fully, that it seemed that there was little left to be said. He gathered that there was no steel employed, so that there would be no degeneration in the apparatus by constant wear. Would there not be the liability of an accumulation of tartar which would retard its action?

Mr. T. S. Carter (Leeds) wished to ask Mr. Bennett if the patients themselves found any difficulty in opening the clasp? and also, how he managed to increase the strength of the clasps? Some patients liked them held lightly, others very firmly; there appeared to be no regulating medium.

Mr. David Hepburn said that if the paper did not call forth any very animated discussion he trusted that Mr. Storer Bennett would not infer that it was from any lack of interest. It appeared to him (Mr. Hepburn) to be a communication of the greatest possible interest, but it was not easy fully to grasp the process and form a sound judgment upon it at a first hearing; in order to discuss the method with any advantage it was necessary to carefully examine the specimens. From a cursory glance he felt that they were most ingenious, and that they were greatly indebted to Mr. Storer Bennett for having brought the subject before them in so able a manner. The only point of criticism that occurred to him at the moment was in connection with the hinged teeth; it seemed to him that in many cases the hinges would interfere with the bite, especially in cases of a close bite. In the illustration marked D the weak point seemed to be the little stud with which the spring was worked. With regard to the particular stud in the illustration, he thought it too long, and that no spring would work satisfactorily with it; apart from that he thought that the ingenuity shown was so great that he would not like to discuss it without first examining the specimens.

Mr. F. J. Bennett, having had the opportunity of examining the specimens from time to time, felt convinced that much which might appear obscure and difficult to understand from a rapid description and rough diagrams, would become clear and easy of comprehension on a careful examination of the complete specimens standing on the models. They appealed to him very strongly as being clever inventions. With regard to the swivels, he might say he thought there was no more difficulty in the apparatus employed here than in the adaptation of them found in cases where swivels were ordinarily employed. No doubt Mr. Storer Bennett would be able to say how long the cases had taken to make, but he believed that they did not take very long, and that no very scientific training was required. Another point was that these cases were not merely untried specimens, but cases that had been worn for more than a year; they were therefore removed from the category of scientific toys, and might be regarded as tried inventions. With regard to the stud that had been remarked upon, he did not think it would interfere so much as a spring, but at any rate it was a case in which at present that had no other successful method of treatment, and therefore he thought that when the cases were carefully examined they would come home to the Members with much greater interest.

Mr. E. Lloyd Williams said it was very evident that the Society did not take so much interest in mechanical as in surgical matters. (Cries of No!) Well, he thought that the want of animation with which the discussion was being conducted was an evidence of the fact. He was about to remark that if anything approaching the ingenuity of the apparatus which had been shown, had been exhibited in connection with an appliance properly belonging to the domain of surgery, he felt confident that there would have been at least a dozen gentlemen prepared to speak at once. He thought that they all had to thank Mr. Storer Bennett for attempting to overcome some of their difficulties—that he would entirely get over them he felt inclined to doubt—and he thought that in time Mr. Storer Bennett would be able to get some appliances of a more simple character. Mr. Hepburn had already mentioned the little adjusting stud marked D; unless altered, he (Mr. Lloyd Williams) did not think they would find many patients whose tongues would tolerate coming in contact with it. There was one other difficulty, viz., the adjustment of the clasps. When the clasp was *in situ* it would of necessity leave a space between it and the teeth, in which the food would lodge. He thought that this was a decided drawback, and if Mr. Storer Bennett could improve the arrangement so that some of the drawbacks could be done away with, the process would be of extreme value, but he thought that in any case the Society were much indebted to Mr Storer Bennett for his ingenuity, and the able manner in which he had explained the method.

Mr. J. H. BADCOCK wished to ask Mr. Storer Bennett of what he made the little pins—whether of gold, or what? If of gold, he thought that would very quickly wear through. Another objection in his mind was that the bands clasping the teeth where they did, would be likely to induce decay. The proper place for the application of a band seemed to him to be round that portion of the tooth where the enamel was thickest.

Mr. STORER BENNETT, in reply, said in reference to Mr. Weiss' remarks, he would observe that tartar might very readily be dissolved by placing the piece in a strong solution of hydrochloric acid. With regard to the bands becoming covered with tartar, he thought it would be obvious that they offered great facilities for cleaning. Mr. Carter asked if any patients found difficulty in opening the bands; so far he had not found any patient who had experienced the difficulty, on the contrary, it was much more easy to remove a plate with a movable band than with a fixed one. With regard to the strength of the spring, it might be adjusted to any extent at the time the plate was being made by putting a longer or shorter spiral spring, or putting one of thicker or thinner wire. In the case of the locking bands, the spring was a small piece of flat gold made as thick or thin as the case required. Again, if it were absolutely necessary to vary the strength of the spring it could be done by removing the pin which ran through the brooch joint, and then changing the spring for one of the requisite strength. Mr. Hepburn drew attention to the possibility of the bite incapacitating one from using the plate with hinged teeth. Of course he (Mr. Bennett) did not pretend that they might be used in all cases; he only contended that they met with difficult cases for which this apparatus would sometimes offer a remedy—he did not for a moment contend that it was universally applicable. It was for the purpose of not interfering with the bite more than was absolutely necessary that he laid stress upon the fact that the pins should be as near the cervix of the tooth as possible. Mr. Hepburn drew attention to the particular stud in the illustration; he had it left exaggeratedly long in the plate purposely, partly with a view of preventing any such impression arising as had occurred to Mr. Hepburn, and partly because if cut off quite level it would have been impossible for him to unscrew it and show the mechanism, but of course, in a finished case, it would be cut off level with the tube. In answer to Mr. Lloyd Williams respecting the space behind the clasps, he would like to ask him if he had ever seen an ordinary plate with an ordinary clasp exhibit a space behind it? If so, he did not think that these bands were any worse than those. These bands, he (Mr. Bennett) contended, were capable of being more accurately fitted to an under-cut or overhanging tooth than any ordinary band could be, but of course, unless properly made, a gap would exist. Mr. Badcock asked if the pins were made of gold. Everything connected with the apparatus was made of gold. The question of the most proper position for placing the band, should not, he thought, be discussed at this meeting. He begged to thank the members for the discussion which had taken place, but confessed that he should like to have heard the opinion of many others present. Before concluding, he would remark that the various parts of the mechanism were originally constructed in his own workroom, but recently they had been made by Mr. Baker, of 55, Great Marlborough Street, to whom he was much indebted for the care which had been exercised in carrying out his designs.

The PRESIDENT observed that if the discussion had flagged in any way it was not for want of interest. He was sure that they all hailed with gratitude anything that helped them over serious difficulties which occasionally arose when making artificial dentures.

The usual vote of thanks concluded the meeting.

Dental News.

GENERAL MEDICAL COUNCIL.

The following is a report of the Dental business transacted at the recent session.

November 22nd.

SIR RICHARD QUAIN, Bart., (President) in the Chair.

COVERING.

THE REGISTRAR said there was on the programme a Report by the Council's Solicitor in regard to a statement submitted to the Executive Committee by the British Dental Association and referred to the Solicitor by the following resolution,—"That the statement of the British Dental Association concerning cases of 'covering' in the practice of dentists be referred to the Solicitor with a request that after communicating with the Dental Association, he will report to the Executive Committee in November, advising the Council as to the course to be adopted."

The Executive Committee had received the following Report from the Solicitor :—

"London, W.C. : *July* 19, 1892.

"Gentlemen,—In accordance with the Minute of the General Medical Council dated 23rd May, 1892, I have been in communication with the British Dental Association, and I have now the honour to send in my report on their statement.

"That statement mentions fourteen cases of 'covering' by Dentists of such a character as would, if proved against a Medical Practitioner involve the removal of his name from the *Register.*

"It seems to me to be as much the duty of the Council to protect the public in the matter of Dentistry as to protect it in the matter of Medical Practice.

"The Executive Committee will, however, recollect with what care the Council proceeded in the case of Medical Practitioners. What years of warning it gave them ; how it promulgated a Minute upon the subject, and took the utmost pains to convey that Minute to every Medical Practitioner ; and how several cases were tried, and the Practitioners warned before any name was taken off the *Medical Register* for the offence of covering.

"I would advise the Council to issue a similar warning to Dentists, and to cause such warning to be conveyed to every Dentist on the *Register*, through the British Dental Association, who have undertaken to promulgate the warning amongst all the Dentists whose names appear on the *Register.* They add that they shall be prepared to undertake such duty to the satisfaction of the Medical Council.

"Looking to the position of a very large number of Dentists, and to the mode in which they have been in the habit of practising, I think that covering in their case should be dealt with even more cautiously, if possible, than it was dealt with in the case of Practitioners on the *General Medical Register*.

"I have the honour to be, Gentlemen,
"Your very faithful servant,
"FREDK. WILLIS FARRER.

"*To the* Executive Committee."

⁂ In regard to this subject the Executive Committee, on November 21, 1892, passed the following *Resolution* :—

"That the Solicitor's *Report* be submitted to the General Council, and that the Solicitor be directed to prepare a draft warning to registered Dentists against the employment of unqualified assistants, analogous to that given to registered Medical Practitioners on April 21, 1883."

SIR WALTER FOSTER moved that the report be received and entered on the minutes.

Mr. WHEELHOUSE seconded the motion, which was agreed to.

SIR W. FOSTER in moving that the report be accepted, said that the duties of the Council with regard to the registration of dentists were very similar to its duties in the case of the registration of Medical Practitioners, and when they pointed out that there was a system of covering existing in the dental profession which was very analogous to the system of covering which existed in the Medical profession, the Council ought to render all the assistance it could in putting down what was an illegal and undesirable practice. It seemed that in various parts of the country the system of using unqualified persons to practise dentistry had been followed very largely, and dentists very naturally and properly complained of it. They having shewn a desire to purify their own ranks from illicit kinds of practice, he thought the Council should as far as it had power to go, give them every opportunity to make their Body as respectable as it could be made under the existing laws.

Dr. GLOVER seconded the motion. The question, he said, was brought forward at a former meeting, but since then the mind of the Council had made progress, and it now saw the propriety of extending the same principle with regard to "covering" to dentists as to the general practitioners, and he hoped the Council would equally act upon the principles it had adopted.

SIR WM. TURNER said there was one point in connection with the resolution which should not be overlooked. The resolution was to the effect that the solicitor be directed to prepare a draft warning to registered dentists against the employment of unqualified assistants. When an analogous document was prepared with reference to Registered Medical Practitioners, which was referred to in the resolution, the document was approved of by the Council before it was issued.

Sir W. Foster said he had no objection to add that.

Sir Wm. Turner said he thought the Council should follow out the same order in that matter, that the draft warning should be submitted to the Council and approved.

Sir W. Foster said he would add those words.

The President said that that would postpone the consideration of the question until next May. It had already been before the Council a year.

Sir Wm. Turner suggested that the solicitor should draw up the draft before that session terminated. He saw no reason why the Council should not have it at that meeting.

Sir W. Foster said the motion would be,—"That the Report be adopted with the understanding that the draft warning be submitted to the Council during the present session."

The motion was agreed to.

November 24th.

Sir Richard Quain (President) in the Chair.

Registered Dentists and Unqualified Assistants.

The Registrar said the Council had to consider the draft warning to Registered Dentists against the employment of unqualified assistants, prepared by the Solicitor pursuant to the direction given in the following resolution of the Executive Committee :—"That the Solicitor's report be submitted to the General Council and that the Solicitor be directed to prepare a draft warning to Registered Dentists against the employment of unqualified assistants, analogous to that given to registered Medical Practitioners on April 21, 1883." The draft warning was,--"Any registered Dentist practising for gain, who knowingly and wilfully deputes a person not registered, or qualified to be registered under the Dentists' Act, to treat professionally on his behalf in any matter requiring professional discretion or skill, any person requiring operations in dentistry of a surgical character, will be liable to be treated as having been guilty of infamous or disgraceful conduct, in a professional respect, and to have his name erased from the Dentists' Register."

Sir Walter Foster moved that the draft warning as drawn up by the Solicitor, be received and adopted.

Mr. Wheelhouse seconded the motion.

Dr. Glover said he understood that the resolution was to be put into the hands of the dental profession. They knew that even with regard to covering, and the regulation which had been drawn up by the Council with respect to it there was still a degree of ignorance professed amongst medical men. He would suggest that a copy of the resolution be sent from the office of the Council, to every person on the Dental Register.

Sir W. Foster said, of course the question of expense must not be forgotten, but, if necessary, he should be prepared to point out the way in which the matter might be best brought before the attention of the dental profession.

The motion for the adoption was agreed to.

Sir W. Foster said that when the matter came before the Executive Committee, it was in consequence of the action taken by the Dental Association by which they offered to circulate any warning amongst their members. He had objected to that course as unworthy of the Council. He did not think they could rely upon any private body doing that kind of work. When a similar warning was adopted by the Council, with reference to the Medical profession, it was published mainly by appearing on the minutes of the Council and being advertised in the Medical Journals. Still, constantly gentlemen were coming forward saying that they were not aware of the action of the Council in the matter. He thought the warning ought to be sent to every Registered Dentist, and though it might cost a little, the Council was well able to spend the money. He would move that the warning be issued from the office of the Council to every gentleman whose name appeared on the Dental Register.

The President considered that the course adopted in giving notice to the medical profession was the course that should also be adopted with reference to the Dentists. The feeling entertained by the Executive Committee, was that they should go to no more expense than they did in the case of the Medical Profession.

Dr. Glover, in seconding Sir W. Foster's motion, thought the expense would not be so very great. As to relying upon the Dentist's Association doing it, he thought such a step would be objectionable. He did not think they should rely upon a body of that description to do the work of the Council.

Sir Wm. Turner called attention to the fact that the Dental Fund was already in debt to the Council. The course of the suggested proceeding would add an additional charge to the fund of about £20 for postage, besides the printing. It seemed to him that the dentists would have no reason to complain, if the Council did for them prècisely what it had done for the medical profession, and he did not think it was called upon to do more. If they advertised the decision of the Council, in the same way as was done in the case of the Medical Profession, and if they gave to such persons as might wish to have them, copies of the resolution for distribution, he thought, they would be complying with all that was necessary.

Mr. Macnamara thought the cost of the printing would be a mere bagatelle. No doubt there was an excess of work in the office, and he suggested that the whole of the notices might be directed and sent out by some lady for a couple of pounds.

The Registrar said it was the wish of the Dentists themselves that the work should be done through their Association. There were about six thousand members on the Dentists' Register ; and they could perhaps pick out the persons who were immediately concerned, and under whose notice they wished to bring the resolution. It was their own desire to undertake to circulate it, and they would do it far better than he could do it.

Sir W. Foster said that no doubt the Dentists' Association would undertake to send it out and select the persons, but he thought it was the Council's duty to warn everybody. If they did not do it, they would have people coming before them saying that they had no notice of the resolution, had never seen any advertisement of it, and plead ignorance to the Council with regard to it.

Dr. Atthill thought it would be undignified on the part of the Council to ask other peeple to do its work. He considered it the Council's duty to let every dentist have a copy of the notice.

Mr. Teale said they were dealing with a different kind of body from the medical profession, and it was of extreme importance that there should be no excuse for anyone saying that they did not know anything about it. He was strongly in favour of sending the notice out from the Council.

The following motion, "That the warning to Registered Dentists against the employment of unqualified assistants, be issued to every dentist whose name appears on the Dental Register," was then put and agreed to.

The PRESIDENT said he considered the course agreed upon was a very great mistake.

THE DENTAL HOSPITAL OF LONDON.

The Annual Dinner of the Past and Present Students of this Institution was held on the 3rd inst., at the Cafe Royal, Sir Richard Quain occupying the Chair. A distinguished company both Medical and Dental assembled to do honour to the Hospital and the Chairman.

The Chairman proposed the health of the past and present students. He said he was present because he recognised the importance of the study of teeth for the welfare and comfort and health of mankind, for diseased teeth not only caused local pain, but were fruitful causes of more general disturbances, such as dyspepsia, malnutrition, reflex nervous disease, and many of the diseases of infancy. He pointed out that the mouth was a great breeding house for bacteria and bacilli, which were now proved to be the cause of many disorders, and therefore that a Bacteriological Department was necessary at a dental hospital.

In alluding to the history of modern dentistry, he said there were two classes of men who had helped its development, viz.:—the practical and the scientific. Among the former he might mention the elder Cartwright, Bigg, and Parkinson; among the latter, John Hunter, Naysmith, Bell, and Tomes.

Upon this foundation the modern system of dentistry had been established, culminating in the dental hospitals and dental departments of general hospitals, with their schools. The examination of the highest surgical authorities required a distinct and prolonged curriculum, and an examination extending over three days, before the dentist of to-day could receive his licence to practise. The Scotch and Irish colleges of surgeons had in no sense been behind-hand in helping forward the development. Having alluded in flattering terms to some of the more distinguished men who had passed through the Hospital and School, he said the General Medical Council are willing to take, and are taking, great interest in advancing this department of the healing art, and he could assure his hearers that that body would do all in their power to help the dentists; but they must help themselves, and he could prophesy ag reat future for them if they would avoid unprofessional actions, and devote themselves earnestly to their noble profession.

Mr. Bryant, President of the Royal College of Surgeons, proposed the Hospital and School, to both of which he alluded in highly complimentary terms: to the former for its value in treating the poor, and to the latter because of its educational work, which provided for the rich properly qualified and skilled dental surgeons.

Dr. Hare, in responding for the Hospital, alluded to the want of proper accommodation for the large number of patients that daily resort to the Hospital for treatment, and to the need of public sympathy and monetary support to provide increased space and larger opportunities for work.

Mr. Morton Smale, the Dean of the School, in responding for the School, said that the development which had taken place in the scientific side of dental surgery, and the fact that it was now a legalised profession, had produced two results: first, an immense increase in the number of cases treated—last year the numbers were 54,177—and second, a large increase in the number of gentlemen entering the profession and requiring dental education, both which factors tended to a crowded state of an already over-burdened Institution, and he maintained that if the future of the School was to compare favourably with the past, that a new hospital must be provided. Such a change would necessitate an expenditure of £40,000, and he had no hesitation in asking the public to help them to provide this sum. The staff and two or three friends of the Hospital had already promised £3,000 for the purpose, and he was quite sure that the public would soon provide the remainder. A dental hospital never receives the public support that it deserves, because it is felt that it treats so small a part of the body, but he could assure them that the proper fitting up and the carrying on of a dental hospital was a very costly proceeding, and he ventured to appeal to those who have received benefit at the hands of dental surgeons to show their appreciation of such services by a liberal donation towards carrying forward the necessary improvements in this Institution. £40,000 was a small sum, if only all who benefit through the existence of this Institution would help. Forty donations of £1,000, eighty donations of £500, or one hundred and sixty donations of £250 and the amount is forthcoming. He was willing, and he was sure other gentlemen in the room were also willing to be numbered amongst the one hundred and sixty.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

The following are the questions set in the Papers at the recent examination for the L.D.S. diploma:—

ANATOMY AND PHYSIOLOGY.

1. After ligature of the common Carotid Artery, how would the collateral circulation be carried on?
2. Mention the Nerves which are distributed to the tongue. Give their several functions.

SURGERY AND PATHOLOGY.

1. How would you treat Hæmorrhage from a wound of the Tongue? Describe the complications which may occur?
2. What is an Abscess, and how is it formed? What are the physical, chemical and microscopical characters of Pus?

DENTAL ANATOMY AND PHYSIOLOGY.

1. Give an account of the spaces and channels other than dentinal tubes which occur in various dentines, and describe their contents.
2. Give examples of—
    (i.) Teeth dwarfed so as to become nearly or quite functionless.
    (ii.) Oral structures other than teeth fulfilling the functions of the latter.
3. Name the periods at which you are able, and those at which you are unable, to determine the age of the human subject from birth to maturity by an inspection of the teeth.

DENTAL SURGERY AND PATHOLOGY.

1. If a tooth has ached
    (i) for short periods with intervals of complete ease,
    (ii) very severely for some hours, pain then ceasing, but returning after some days,

What can you infer as to the state of the pulp, and what treatment would you adopt in each case?

2. A heavy blow has been received upon the upper front teeth, fracturing some; what are the various forms of injury they may have sustained, and how would you severally treat them?

3. Where and by what means would you perforate the antrum?

(i.) The teeth being all in place and healthy;
(ii.) The canine and second molar and the intervening teeth being reduced to stumps;
(iii.) The jaw being edentulous.

Correspondence.

[The Editor does not hold himself responsible for the opinions expressed by his correspondents.]

To the Editor of the "British Journal of Dental Science."

Sir,—I was not surprised to find that your editorial remarks in the last issue of the Journal expressed satisfaction at the *tendency* of the General Medical Council "to pay attention to the legitimate demands of the dentists" and that you did not add a list of actual benefits conferred on dentists by the council. It is now over thirty-two years since the Dental profession was tacked on to the Medical, and, according to the returns in the *Dental Register*, something like £8,000 has been paid by the dentists to the Council funds. What have we received in return for this?

At the recent session of the Medical Council, we are told, they required their solicitor to remind them that "it was as much their duty to protect the public in the matter of dentistry as to protect it in the matter of medical practice." A little late in the day surely, to make such a startling discovery! but still one must feel glad that it has been made.

No doubt the public need to be protected, and respectable dentists themselves need to be protected, against incompetent quacks and sham diplomas, against advertisers in cheap rubbish, against men who have been detected in imposition or other unprofessional conduct and so forth. But how are we served by this new zeal of the Medical Council, who now practically tell us that, if we employ an American assistant, however skilful he may be, if he happens to be unregistered, we are "liable to be treated as having been guilty of infamous or disgraceful conduct."

Surely the public need protection against incompetence and shams not against skilful assistants of registered practitioners.

According to the Dentists Act of 1878, clause 3, it appears that any English Medical man, let him be ever so ignorant of dental matters, as most of them are, can practise as a dentist without being registered or take a berth as dental assistant if one should be offered. How are the public protected by allowing experts in midwifery to practise dentistry to their hearts content, whilst it is to be an infamy and a disgrace, forsooth, for a registered practitioner to engage the most skilful expert in dentistry if his training did not happen to be English?

In a young country like New Zealand or Australia, dentists are very well able to manage their own affairs. British dentists, over five thousand in number, submit themselves for guidance and tutelage to the members of another profession who take their fees for three and thirty years and then begin to talk to them of infamy and disgrace. I fancy that this result is not precisely what was anticipated by the worthy dentists who thought they would raise their social status by tacking themselves to the coat-tails of the medical practitioner.

Is it not almost time to reconsider our position? If we are to be a mere annexe of the medical profession, why not at once dissolve the Dental and amalgamate with the Medical Association, and take their laws and regulations for our own? And if as some say we are specialists in Surgery and therefore require special legislation, how is it that Aurists and others do not? Once amalgamated how very interesting would be the papers we should hear read and discussed at the annual meetings, on ovariotomy, say, or exophthalmic goitre, and how useful to us in our daily practice.

Dentistry is and always will be a mechanical profession, though undoubtedly it has a surgical aspect. I don't think I shall be misunderstood even by dentists whose surgical skill and training are beyond dispute. The most successful dentist is the best manipulator and not the 'ology man.

As for the value of this new resolution of the Medical Council, I do not believe that it is worth the paper it is written on. There is nothing in theDentists Act which gives them power legal or moral, to interfere with contracts made in the past between registered dentists and expert assistants registered or not.

It seems to me that the British dental profession is quite strong enough to stand alone, to protect itself and the public against quackery incompetence and sham qualifications, and, above all, to elect a representative Council in order to say what is and what is not "infamous and disgraceful." When British dentists obtain a charter of their own and manage their own affairs it will be for them to say whether the Dental Association shall be converted into a trades union. For my part I don't believe they would stand it; but, however that might be, they would cease to be either patronised or lectured by another profession.

Yours faithfully,

J. L. ROBERTSON.

13, Royal Crescent, Cheltenham.

To the Editor of the "British Journal of Dental Science."

SIR,—An unqualified surgical mechanical assistant of over ten years standing wishes to know if he will be debarred in the future from his living as such in consequence of the late warning to Dentists, and whether he will have to depend on the work-room only in the future.

Yours &c.

HARD LINES.

To the Editor of the "British Journal of Dental Science."

SIR,—What does the recent caution to Dentists mean? Does it meant that an unqualified though competent assistant will be unable in the future to take an Impression, match a shade, fit a denture, scale teeth or insert a dressing in a tooth to hold a case over during the temporary absence of his principal, or is it simply aimed at Branch establishments with unqualified assistants in charge.

Yours, &c.

ENQUIRER.

ANSWER TO CORRESPONDENT.

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4. It is earnestly requested of our correspondents that their communications be written on one side of the sheet only; and we also beg to call particular attention to the importance of a carefully-penned signature and address.
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